

FIGURE 1

DATABASE RECORDS:

Customer Id: c1500
First: Joe
Last: Smith
City: San Diego
Email: joesmith@company.com
Phone: (555) 555-5555
Fax: (555) 551-5555

Customer Id: c1600
First: John
Last: Smith
City: San Diego
Email: johnsmith@company.com
Phone: (555) 552-5555
Fax: (555) 553-5555

FIGURE 2

CUSTOMER.DTD

```
300 { <!ELEMENT CUSTOMER
      (customer_name+, email*, phone*, fax?)>
302 { <!ATTLIST CUSTOMER customer_id ID #REQUIRED>
      <!ATTLIST CUSTOMER city #REQUIRED>
      <!-- ? = zero or one; * = zero or more; + = one or more --->
304 { <ELEMENT customer_name (first+, last+)>
      <ELEMENT first (#PCDATA)>
306 { <ELEMENT last (#PCDATA)>
      <ELEMENT email (#PCDATA)>
      <ELEMENT phone (#PCDATA)>
      <ELEMENT fax (#PCDATA)>
```

FIGURE 3A

:

XML DOCUMENT:

```
308 { <?xml version="1.0" standalone="no"?>
      <!DOCTYPE CUSTOMER SYSTEM "customer.dtd">
310 { <CUSTOMER customer_id="c1500" city="san diego">
312 {   <customer_name>
314 {     <first>Joe</first>
312 {     <last >Smith</last>
      </customer_name>
      <email>joesmith@company.com</email>
316 {   <phone> (555) 555-5555</phone>
      <fax> (555) 555-5555</fax>
310 { </CUSTOMER>
```

FIGURE 3B

```
400 { <?xml version="1.0" standalone="yes"?>
      <!DOCTYPE CUSTOMER
      [
      <!ELEMENT CUSTOMER
        (customer_name+, email*, phone*, fax?)>
        <!ATTLIST CUSTOMER customer_id ID #REQUIRED>
        <!ATTLIST CUSTOMER city #REQUIRED>
        <!-- ? = zero or one; * = zero or more; + = one or more --->
402 { <ELEMENT customer_name (first+, last+)>
      <ELEMENT first (#PCDATA)>
      <ELEMENT last (#PCDATA)>
      <ELEMENT email (#PCDATA)>
      <ELEMENT phone (#PCDATA)>
      <ELEMENT fax (#PCDATA)>
      ]>

      <CUSTOMER customer_id="c1500" city="san diego">
        <customer_name>
          <first>Joe</first>
          <last>Smith</last>
        </customer_name>
        <email>joesmith@company.com</email>
        <phone>(555) 555-5555</phone>
        <fax>(555) 555-5555</fax>
      </CUSTOMER>
```

FIGURE 4

XML DOCUMENT (INPUT DATA):

```
<sales>

  <division id="North">
    <revenue>10</revenue>
    <growth>9</growth>
    <bonus>7</bonus>
  </division>

  <division id="South">
    <revenue>4</revenue>
    <growth>3</growth>
    <bonus>4</bonus>
  </division>

  <division id="West">
    <revenue>6</revenue>
    <growth>-1.5</growth>
    <bonus>2</bonus>
  </division>

</sales>
```

FIGURE 5

XSL STYLE SHEET:

```
<html xmlns:xsl="1.0"
      xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
      lang="en">
  <head>
    <title>Sales Results By Division</title>
  </head>
  <body>
    <table border="1">
      <tr>
        <th>Division</th>
        <th>Revenue</th>
        <th>Growth</th>
        <th>Bonus</th>
      </tr>
      <xsl:for-each select="sales/division">
        <!-- order the result by revenue -->
        <xsl:sort select="revenue"
                  data-type="number"
                  order="descending"/>
        <tr>
          <td>
            <em><xsl:value-of select="@id"/></em>
          </td>
          <td>
            <xsl:value-of select="revenue"/>
          </td>
          <td>
            <!-- highlight negative growth in red -->
            <xsl:if test="growth < 0">
              <xsl:attribute name="style">
                <xsl:text>color:red</xsl:text>
              </xsl:attribute>
            </xsl:if>
            <xsl:value-of select="growth"/>
          </td>
          <td>
            <xsl:value-of select="bonus"/>
          </td>
        </tr>
      </xsl:for-each>
    </table>
  </body>
</html>
```

FIGURE 6

HTML OUTPUT:

```
<html lang="en">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<title>Sales Results By Division</title>
</head>
<body>
<table border="1">
<tr>
<th>Division</th><th>Revenue</th><th>Growth</th><th>Bonus</th>
</tr>
<tr>
<td><em>North</em></td><td>10</td><td>9</td><td>7</td>
</tr>
<tr>
<td><em>West</em></td><td>6</td><td style="color:red">-1.5</td><td>2</td>
</tr>
<tr>
<td><em>South</em></td><td>4</td><td>3</td><td>4</td>
</tr>
</table>
</body>
</html>
```

FIGURE 7

{PRIVATE}__NARA_article_begin__:_____
Path: news.sdsc.edu!newshub.csu.net!newshub.sdsu.edu!newsfeed.berkeley.edu!
news.cis.ohiostate.edu!news.rootsweb.com!rootsweb-gw
From: Casivers@aol.com
Newsgroups: soc.genealogy.hispanic
Subject: Passenger Lists for Ships from Spain To Cuba
Date: 22 Mar 1999 16:20:37 -0800
Organization: RootsWeb Genealogical Data Cooperative
Lines: 7
Message-ID: <2376321.36f6de03@aol.com
NNTP-Posting-Host: localhost
Mime-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
X-Trace: bl-1.rootsweb.com 922148437 3147 127.0.0.1 (23 Mar 1999 00:20:37 GMT)
X-Complaints-To: usenet@news.rootsweb.com
NNTP-Posting-Date: 23 Mar 1999 00:20:37 GMT
Xref: news.sdsc.edu soc.genealogy.hispanic:3156

Does anyone know where I can get passengers lists for
ships that transported Spaniards to Cuba circa 1860's?

Any help would be appreciated.

Thanks,

Cheryl Sanchez-Sivers

__NARA_article_end__:_____

FIGURE 8


```
<!ELEMENT rfc1036_mesg (headers, body)>

<!ELEMENT headers (required_headers, optional_headers, other_headers)>
<!ELEMENT body #PCDATA>

<!ELEMENT required_headers (From, Date, Newsgroups, Subject, Message-ID, Path)>
<!ELEMENT optional_headers (Followup-To?, Expires?, Reply-To?, Sender?, References?, Control?, Distribution?,
Keywords?, Summary?, Approved?, Lines?, Xref?, Organization?)>
<!ELEMENT other_headers other+>

<!ELEMENT From #PCDATA>
<!ELEMENT Date #PCDATA>
<!ELEMENT Newsgroups #PCDATA>
<!ELEMENT Subject #PCDATA>
<!ELEMENT Message-ID #PCDATA>
<!ELEMENT Path #PCDATA>

<!ATTLIST From seqno CDATA #REQUIRED>
<!ATTLIST Date seqno CDATA #REQUIRED>
<!ATTLIST Newsgroups seqno CDATA #REQUIRED>
<!ATTLIST Subject seqno CDATA #REQUIRED>
<!ATTLIST Message-ID seqno CDATA #REQUIRED>
<!ATTLIST Path seqno CDATA #REQUIRED>

<!ELEMENT Followup-To #PCDATA>
<!ELEMENT Expires #PCDATA>
<!ELEMENT Reply-To #PCDATA>
<!ELEMENT Sender #PCDATA>
<!ELEMENT References #PCDATA>
<!ELEMENT Control #PCDATA>
<!ELEMENT Distribution #PCDATA>
<!ELEMENT Keywords #PCDATA>
<!ELEMENT Summary #PCDATA>
<!ELEMENT Approved #PCDATA>
<!ELEMENT Lines #PCDATA>
<!ELEMENT Xref #PCDATA>
<!ELEMENT Organization #PCDATA>

<!ATTLIST Followup-To seqno CDATA #REQUIRED>
<!ATTLIST Expires seqno CDATA #REQUIRED>
<!ATTLIST Reply-To seqno CDATA #REQUIRED>
<!ATTLIST Sender seqno CDATA #REQUIRED>
<!ATTLIST References seqno CDATA #REQUIRED>
<!ATTLIST Control seqno CDATA #REQUIRED>
<!ATTLIST Distribution seqno CDATA #REQUIRED>
<!ATTLIST Keywords seqno CDATA #REQUIRED>
<!ATTLIST Summary seqno CDATA #REQUIRED>
<!ATTLIST Approved seqno CDATA #REQUIRED>
<!ATTLIST Lines seqno CDATA #REQUIRED>
<!ATTLIST Xref seqno CDATA #REQUIRED>
<!ATTLIST Organization seqno CDATA #REQUIRED>

<!ELEMENT other #PCDATA>

<!ATTLIST other
keyword CDATA #REQUIRED
seqno CDATA #REQUIRED>
```

FIGURE 9

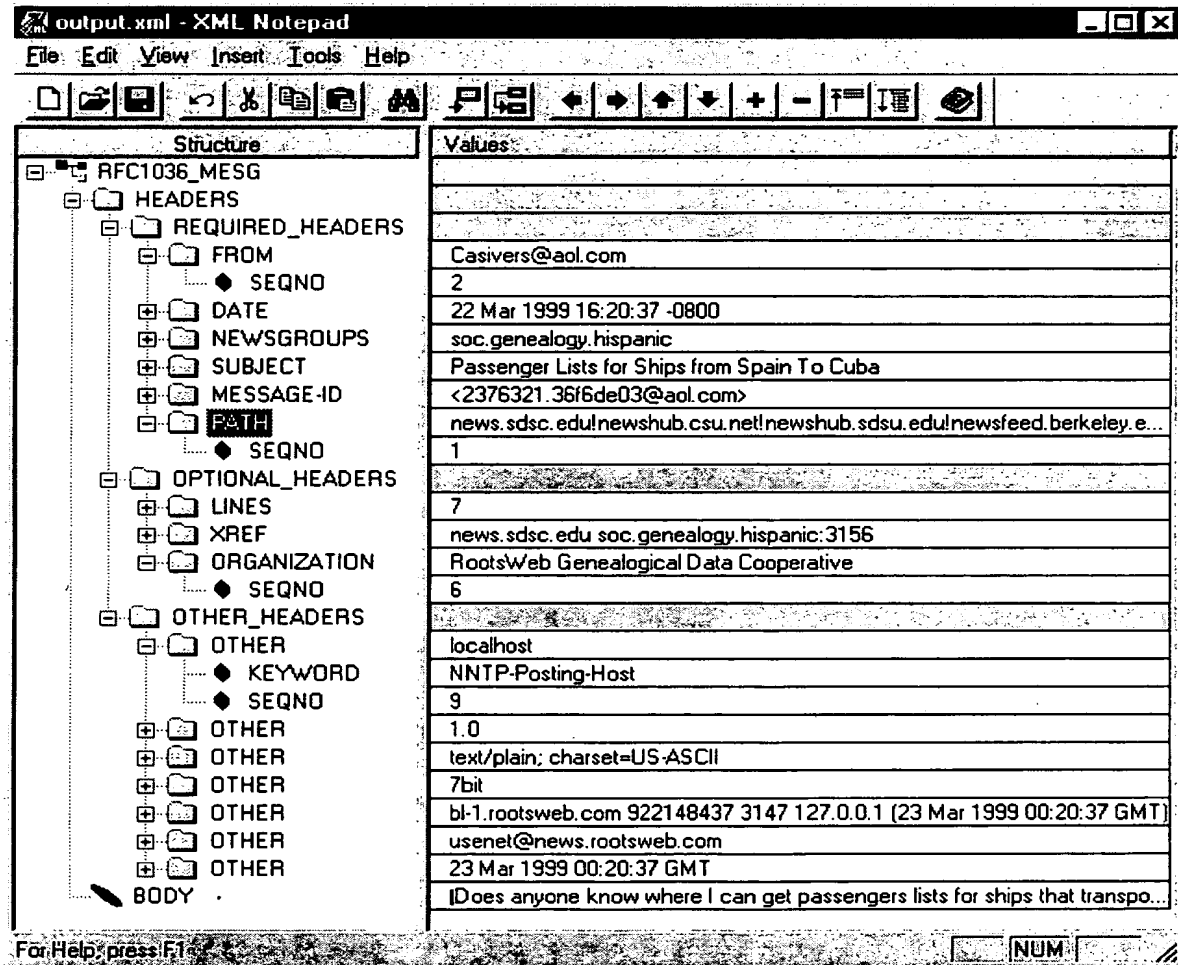
```
create table ngrps_headers_core (
  internalMsgId    integer    not null,
  FromInfo        varchar(200) not null,
  MsgDate         varchar(50)  not null,
  Newsgroups      varchar(1900) not null,
  SubjectInfo     varchar(1900) not null,
  MessageId       varchar(200) not null,
  PathInfo        varchar(1900) not null,
  FollowupTo      varchar(1900),
  ExpiresOn       varchar(50),
  ReplyTo         varchar(200),
  SenderInfo      varchar(200),
  ReferencesInfo  varchar(1900),
  ControllInfo    varchar(1900),
  DistributionInfo varchar(500),
  KeywordsInfo    varchar(1900),
  SummaryInfo     varchar(1900),
  ApprovedInfo    varchar(500),
  LinesOfEmail    integer,
  XrefInfo        varchar(500),
  OrganizationInfo varchar(500),
  FromSeqNum      integer,
  MsgDateSeqNum   integer,
  NewsgroupsSeqNum integer,
  SubjectSeqNum   integer,
  MessageIdSeqNum integer,
  PathSeqNum      integer,
  FollowupToSeqNum integer,
  ExpiresSeqNum   integer,
  ReplyToSeqNum   integer,
  SenderSeqNum    integer,
  ReferencesSeqNum integer,
  ControlSeqNum   integer,
  DistributionSeqNum integer,
  KeywordsSeqNum  integer,
  SummarySeqNum   integer,
  ApprovedSeqNum  integer,
  LinesSeqNum     integer,
  XrefSeqNum      integer,
  OrganizationSeqNum integer,
  primary key (internalMsgId),
  unique (MessageId,MsgDate)
);

create table ngrps_headers_othr (
  internalMsgId    integer    not null,
  HdrKeyName       varchar(50),
  HdrKeyValue      varchar(2000),
  HdrKeySeqNum     integer,
  foreign key (internalMsgId) references ngrps_headers_core (internalMsgId)
);

create table container_info (
  internalId       integer    not null,
  data_id          integer    not null,
  posInContainer   integer,
  sizeOfMsg        integer,
  foreign key (internalId) references ngrps_headers_core(internalMsgId),
  foreign key (data_id) references MDAS_AD_REPL(data_id)
);
```

FIGURE 10

FORMATTED MESSAGE USING XML DTD



The screenshot displays the XML Notepad application window titled "output.xml - XML Notepad". The interface is divided into two main panes: "Structure" on the left and "Values" on the right. The "Structure" pane shows a hierarchical tree of an RFC1036 message, including headers (REQUIRED, OPTIONAL, OTHER) and the body. The "Values" pane lists the corresponding values for each element in the structure.

Structure	Values
RFC1036_MSG	
HEADERS	
REQUIRED_HEADERS	
FROM	Casivers@aol.com
◆ SEQNO	2
DATE	22 Mar 1999 16:20:37 -0800
NEWSGROUPS	soc.genealogy.hispanic
SUBJECT	Passenger Lists for Ships from Spain To Cuba
MESSAGE-ID	<2376321.36f6de03@aol.com>
PATH	news.sdsc.edu!newshub.csu.net!newshub.sdsu.edu!newsfeed.berkeley.e...
◆ SEQNO	1
OPTIONAL_HEADERS	
LINES	7
XREF	news.sdsc.edu soc.genealogy.hispanic:3156
ORGANIZATION	RootsWeb Genealogical Data Cooperative
◆ SEQNO	6
OTHER_HEADERS	
OTHER	localhost
◆ KEYWORD	NNTP-Posting-Host
◆ SEQNO	9
OTHER	1.0
OTHER	text/plain; charset=US-ASCII
OTHER	7bit
OTHER	bl-1.rootsworld.com 922148437 3147 127.0.0.1 (23 Mar 1999 00:20:37 GMT)
OTHER	usenet@news.rootsworld.com
OTHER	23 Mar 1999 00:20:37 GMT
BODY	Does anyone know where I can get passengers lists for ships that transpo...

For Help, press F1

FIGURE 11

WEB-BASED INTERFACE FOR ACCESSING THE E-MAIL COLLECTION.

MCAT-SRB A Data Integration System - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Address http://srb.npaci.edu/ Go Links »

Create New Vu-Schema	Add Attribute To Vu-Schema
Drop Vu-Schema	Drop Attribute From Vu-Schema
Query & Update	Display Vu Schema

Field Demos

Field Demonstrations for News Groups

Demo #1: Postings of Eric Lancaster

Demo #2: Postings on 7th January 1999

Demo #3: Postings on the *Classical Studies* Subject with line count above 1000 but below 5000

Demo #4: Postings with Content-Type header

Demo #5: Non-required and non-optional headers

Collection-level Metadata

Object-level Metadata

Collection Life-Cycle and Statistics

Attribute Names

mcatcore.data name	=		
mcatcore.data collection name	=		
newsgroups.posInContainer	=		
newsgroups.sizeOfMsg	=		
newsgroups.MessageId	=		
newsgroups.FromInfo	=		
newsgroups.MsgDate	like		7 Jan 199
newsgroups.Newsgroups	=		
newsgroups.SubjectInfo	=		
newsgroups.SenderInfo	=		
newsgroups.KeywordsInfo	=		
newsgroups.LinesOfEmail	=		

Output Format: Tabular ☐ Linear ☐ Tiled ☐ Form1 ☐ Form2 ☒

Number of Items to Display: OuterJoin: ☐ Yes ☒ No

FIGURE 12



<!ELEMENT caccf_collection (caccf_database)*>	list of CACCF databases
<!ELEMENT caccf_database (date_id, record_size, caccf_records)>	a single database creation date, identifies the database size of each record (bytes) the actual data records
<!ELEMENT caccf_records (caccf_record*)>	list of caccf records

FIGURE 14

<!ELEMENT caccf_record EMPTY		all info is in the attributes	
>			
<!ATTLIST caccf_record		length	meaning
ms	CDATA #REQUIRED	1	Military Service (DoD Component)
cc	CDATA #REQUIRED	2	Country of Casualty
tc	CDATA #REQUIRED	2	Type of Casualty
rn	CDATA #REQUIRED	5	Reference Number (File Ref. No)
na	CDATA #REQUIRED	28	Name (of Casualty)
dp	CDATA #REQUIRED	4	Date Record Processed (YYMM)
sn	CDATA #REQUIRED	9	Social Security OR Service Num.
mg	CDATA #REQUIRED	4	Military Grade (Grade or Rate)
pg	CDATA #REQUIRED	2	Pay Grade (Grade or Rate)
dd	CDATA #REQUIRED	8	Date of Death (MM/DD/YY) (Casualty)
hc	CDATA #REQUIRED	20	"Home of Record" City (Place)
hs	CDATA #REQUIRED	2	"Home of Record" State Code
oc	CDATA #REQUIRED	5	Service Occupation Code
db	CDATA #REQUIRED	8	Date of Birth (MM/DD/YY)
rc	CDATA #REQUIRED	1	Reason (Cause of Casualty)
ai	CDATA #REQUIRED	1	Aircraft or Not Aircraft
ra	CDATA #REQUIRED	1	Race
re	CDATA #REQUIRED	2	Religion Code (Religious Denom.)
le	CDATA #REQUIRED	2	Length of Service in Years
ma	CDATA #REQUIRED	1	Marital Status
se	CDATA #REQUIRED	1	Sex
ci	CDATA #REQUIRED	1	Citizen Code
pp	CDATA #REQUIRED	1	Posthumous Promotion
dt	CDATA #REQUIRED	6	Date Tour in Southeast Asia
lr	CDATA #REQUIRED	1	Last Record Code
br	CDATA #REQUIRED	3	Body Recovered or Not
ag	CDATA #REQUIRED	2	Age at Time of Casualty
sc	CDATA #REQUIRED	1	Component (Service Component)
co	CDATA #REQUIRED	29	Comments
ty	CDATA #REQUIRED	2	Type
pc	CDATA #REQUIRED	2	Province Code (South Vietnam
Provinces &			Military Regions)
mc	CDATA #REQUIRED	2	CORPCD
pr	CDATA #REQUIRED	2	PROCD
fl	CDATA #REQUIRED	2	Flag
>			

FIGURE 15

PERSISTENT ARCHIVES
Inventors: Reagan W. Moore, et al.
Howrey Docket No. 02737.0004.NPUS01
16/118

```

create table CACCF (
  REC_NO          int not null,
  MIL_SERVICE     char (1),
  CASUALTY_COUNTRY char (2),
  CASUALTY_TYPE   char (2),
  REF_NO          char (5),
  NAME            char (28),
  PROCESSED       char (4),
  SSN_SERVICE_NO  char (9),
  GRADE           char (4),
  PAY_GRADE       char (2),
  DIED            date,
  HOR_CITY        char (20),
  HOR_STATE       char (2),
  OCCUPATION      char (5),
  BORN            date,
  CASUALTY_REASON char (1),
  AIR             char (1),
  RACE            char (1),
  RELIGION        char (2),
  SERVICE_LENGTH  char (2),
  MARITAL_STATUS  char (1),
  SEX             char (1),
  CITIZEN         char (1),
  PH_PROMOTION    char (1),
  SEA_TOUR        date,
  LAST_RECORD     char (1),
  BODY_RECOVERED  char (3),
  AGE             char (2),
  COMPONENT       char (1),
  COMMENTS        char (29),
  TYPE            char (2),
  PROVINCE        char (2),
  Military Regions)
  CORPCD          char (2),
  PROCD           char (2),
  FLAG            char (2),
  NOTES           varchar (1000) -- DICE: notes/corrections made
  PRIMARY KEY     (SSN_SERVICE_NO),
  UNIQUE          (REC_NO)
)
  
```

-- DICE: no. as found in the source
 -- Military Service (DoD Component)
 -- Country of Casualty
 -- Type of Casualty
 -- Reference Number (File Ref. No)
 -- Name (of Casualty)
 -- Date Record Processed (YYMM)
 -- Social Security OR Service Num.
 -- Military Grade (Grade or Rate)
 -- Pay Grade (Grade or Rate)
 -- Date of Death (MM/DD/YY)(Casualty)
 -- "Home of Record" City (Place)
 -- "Home of Record" State Code
 -- Service Occupation Code
 -- Date of Birth (MM/DD/YY)
 -- Reason (Cause of Casualty)
 -- Aircraft or Not Aircraft
 -- Race
 -- Religion Code (Religious Denom.)
 -- Length of Service in Years
 -- Marital Status
 -- Sex
 -- Citizen Code
 -- Posthumous Promotion
 -- Date Tour in Southeast Asia
 -- Last Record Code
 -- Body Recovered or Not
 -- Age at Time of Casualty
 -- Component (Service Component)
 -- Comments
 -- Type
 -- Province Code (South Vietnam Provinces and
 -- CORPCD
 -- PROCD
 -- Flag

FIGURE 16

PERSISTENT ARCHIVES
Inventors: Reagan W. Moore, et al.
Howrey Docket No. 02737.0004.NPUS01
17/118

```
/* Find records with incomplete BORN or DIED date: */
SQL> select REC_NO, NAME, BORN, DIED, AGE from CACCF
where BORN is null or DIED is null;
REC_NO NAME BORN DIED AG
-----
2114 SEVENBERGEN JERRY L 16-MAR-66 0
3882 DOMINGUEZ MICHAEL J 10-SEP-66 0
3883 JORDAN ALLAN H 10-SEP-66 0
...
33997 HALIBURTON MICHAEL R 08-AUG-70 0
17 rows selected.
/* How many entries do NOT have a value for 'Date Tour in Southeast Asia'? */
SQL> select count (*) from CACCF where SEA_TOUR is null;
COUNT(*)
```

FIGURE 17

/* What is the number and min/max/average age of the casualties over entries where AGE is available? */

SQL> select count(*), min(AGE), max(AGE), avg(AGE)

- from CACCF
- where not AGE = '0';

COUNT(*)	MI	MA	AVG(AGE)
-----	--	--	-----
58164	16	62	22.7932742

FIGURE 18

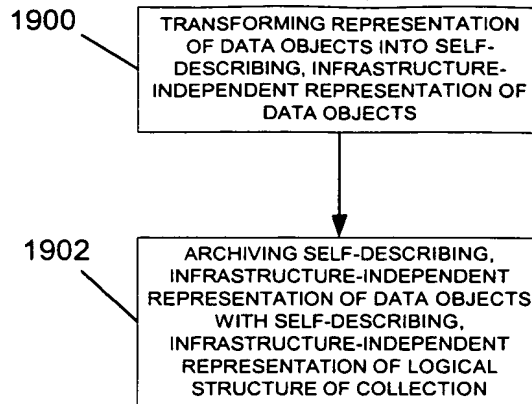


FIGURE 19

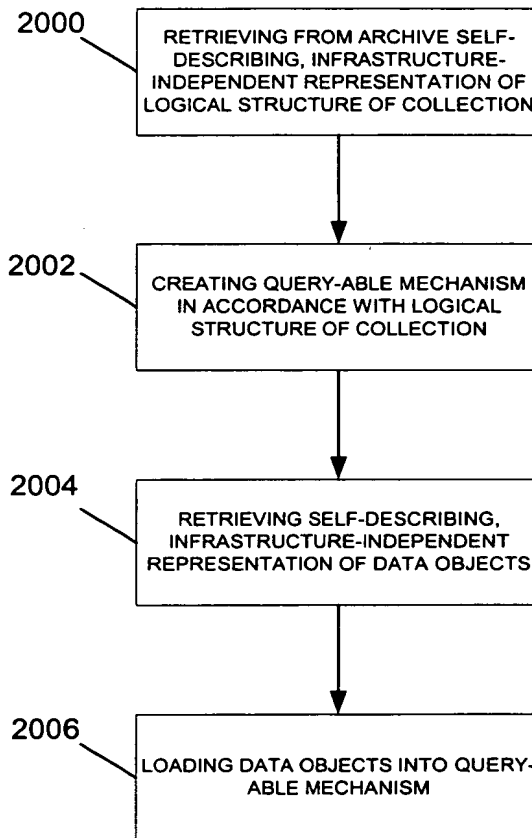


FIGURE 20

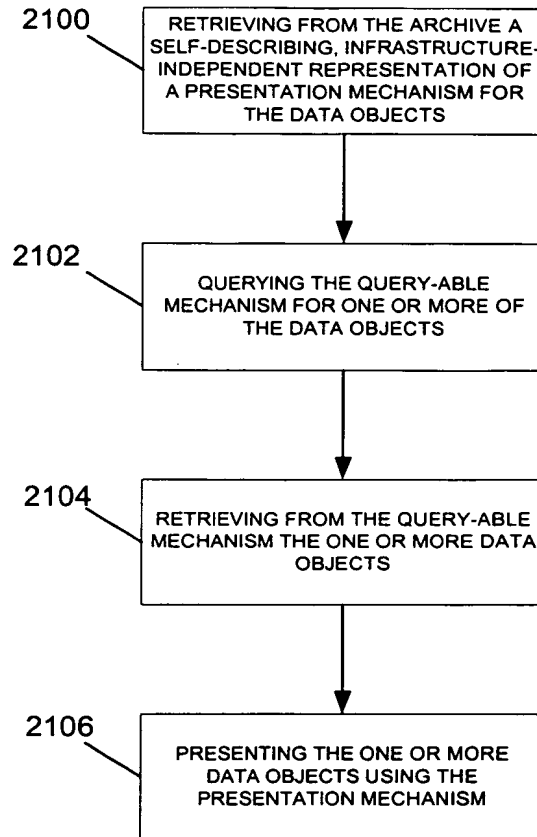


FIGURE 21A

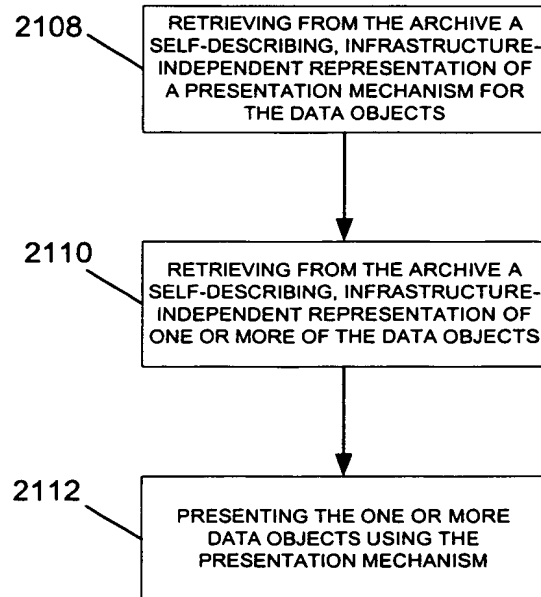


FIGURE 21B

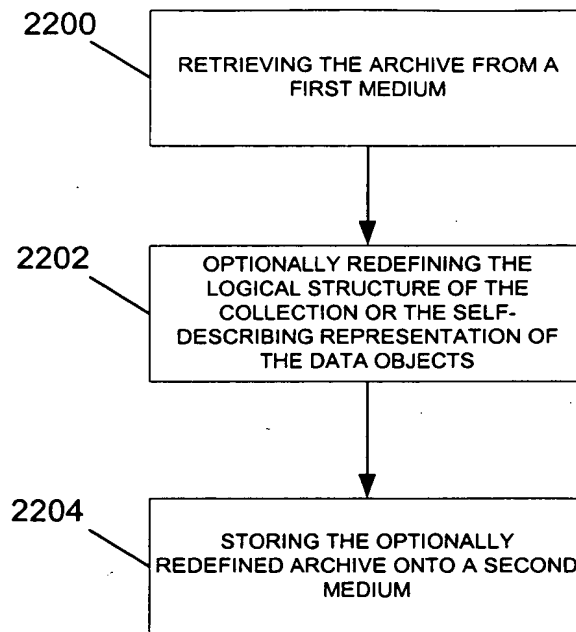


FIGURE 22

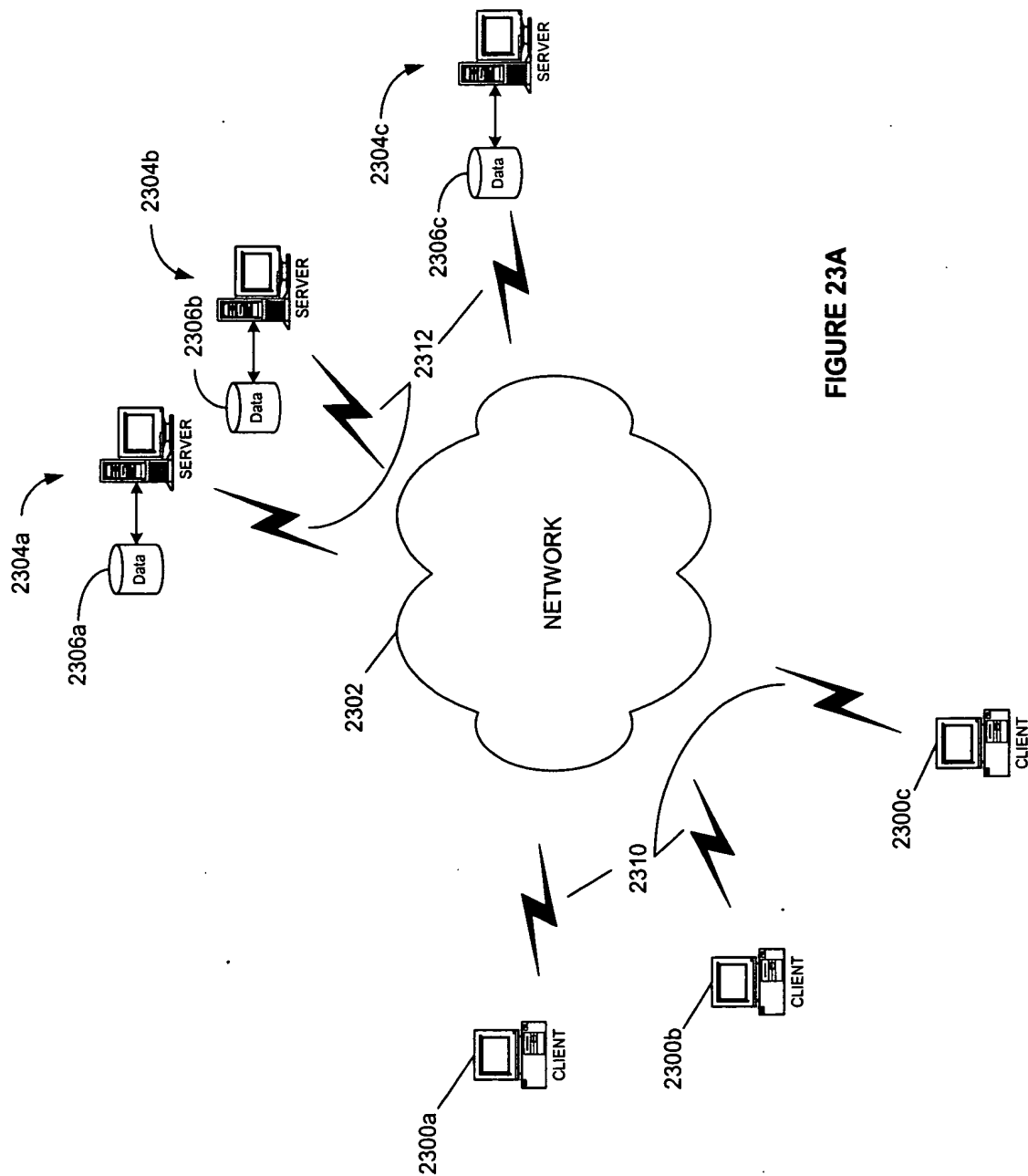


FIGURE 23A

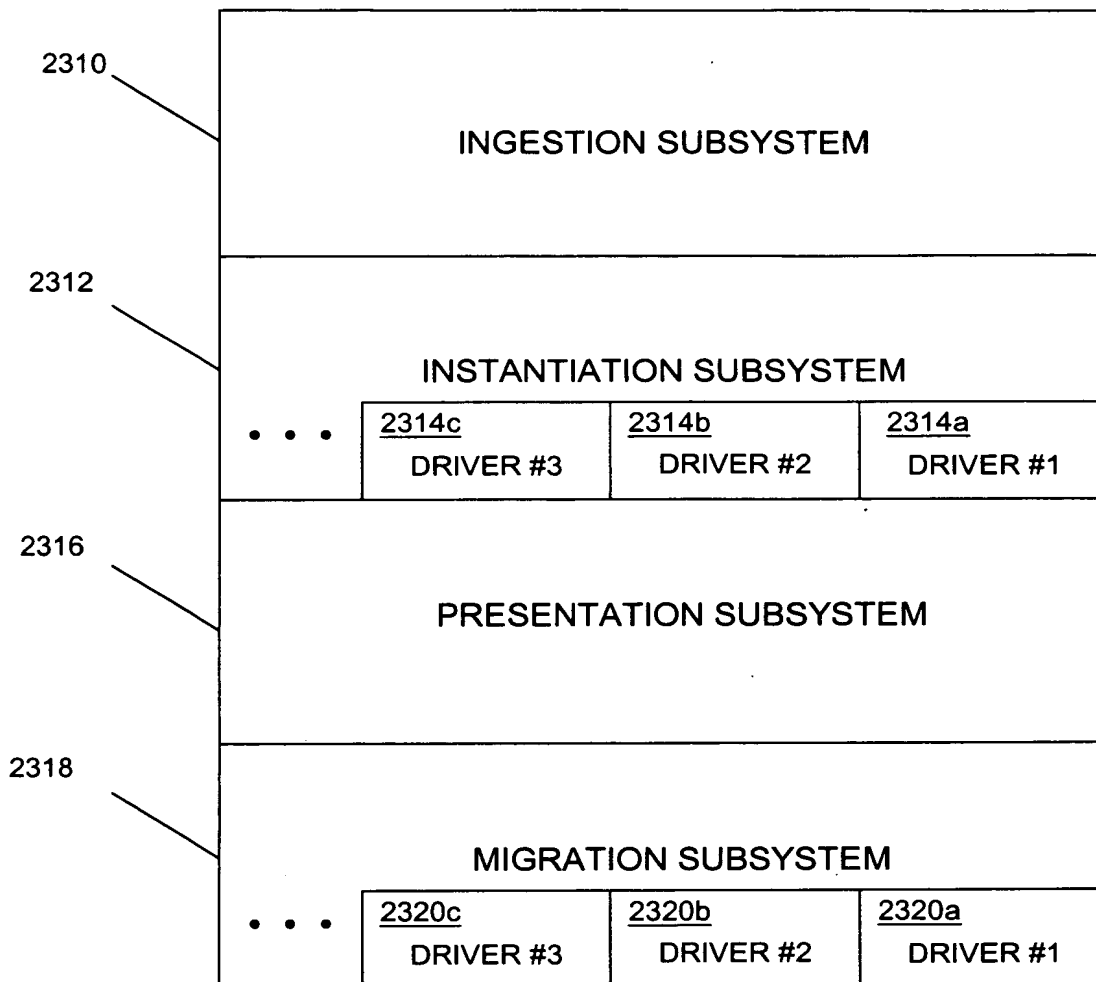


FIGURE 23B

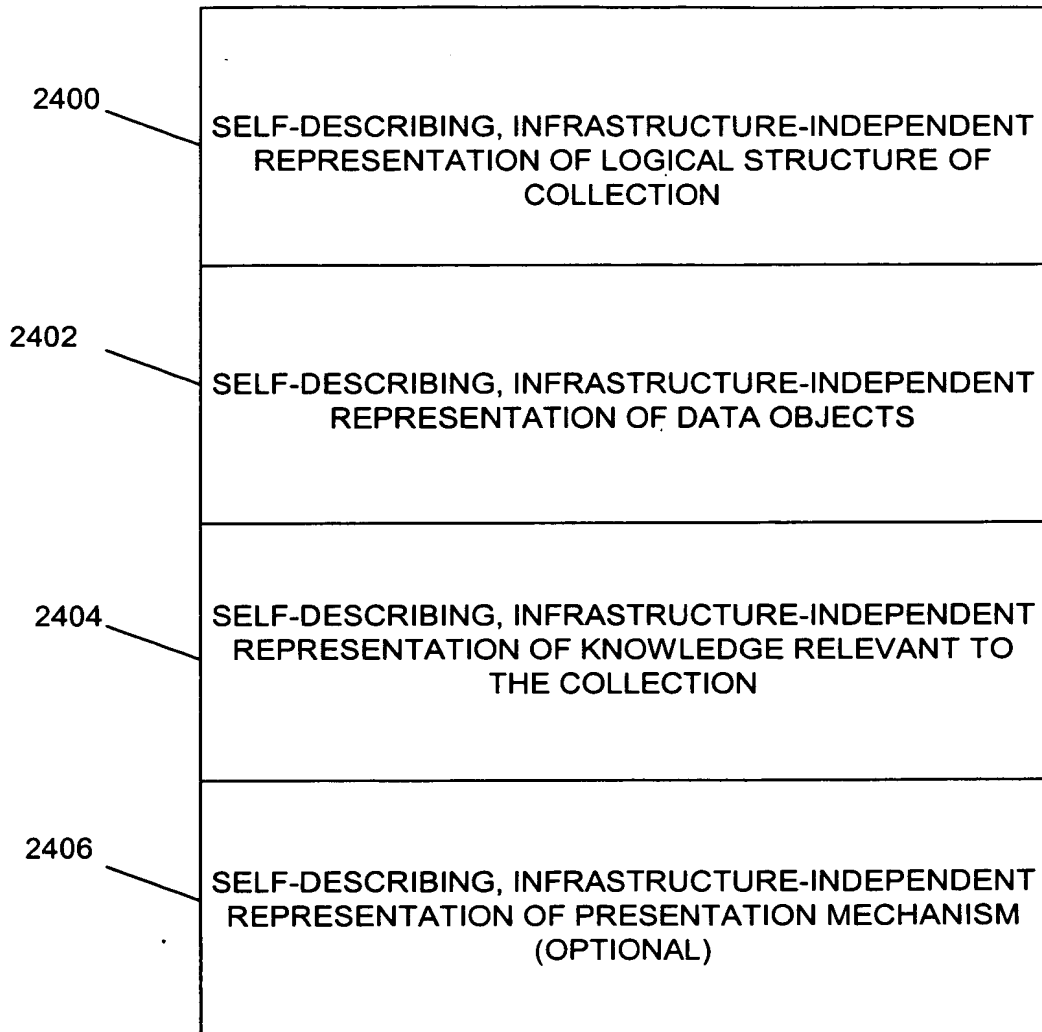


FIGURE 24


```
<!ELEMENT DOCUMENT (CONGRESS|RESOLUTION|ATTESTATION)* >
<!ATTLIST DOCUMENT DOCID CDATA #IMPLIED>
<!ATTLIST DOCUMENT REFERENCENUMBER CDATA #IMPLIED>
<!ATTLIST DOCUMENT CLASS CDATA #IMPLIED>

<!ELEMENT CONGRESS (NUMBER|SESSIONNUMBER|(BODYOFCONGRESS)*|DATE) >
<!ELEMENT NUMBER (#PCDATA)* >
<!ELEMENT SESSIONNUMBER (#PCDATA)* >
<!ELEMENT BODYOFCONGRESS (#PCDATA)* >
<!ELEMENT DATE (#PCDATA)* >
<!ELEMENT RESOLUTION (TYPE|STATEMENT)* >
<!ELEMENT TYPE (#PCDATA)* >
<!ELEMENT STATEMENT (OPENING|(STRIKEOUT|INSERT)*|CLOSING) >
<!ELEMENT OPENING (#PCDATA)* >
<!ELEMENT STRIKEOUT (#PCDATA)* >
<!ELEMENT INSERT (#PCDATA)* >
<!ELEMENT CLOSING (#PCDATA)* >
<!ELEMENT ATTESTATION (#PCDATA)* >
```

FIGURE 25

```
<!ELEMENT DOCUMENT (CONGRESS|ACT)* >

<!ATTLIST DOCUMENT DOCID CDATA #IMPLIED>
<!ATTLIST DOCUMENT REFERENCENUMBER CDATA #IMPLIED>
<!ATTLIST DOCUMENT CLASS CDATA #IMPLIED>

<!ELEMENT CONGRESS (NUMBER|SESSIONNUMBER|BODYOFCONGRESS|DATE) >
<!ELEMENT NUMBER (#PCDATA)* >
<!ELEMENT SESSIONNUMBER (#PCDATA)* >
<!ELEMENT BODYOFCONGRESS (#PCDATA)* >
<!ELEMENT DATE (#PCDATA)* >

<!ELEMENT ACT (PURPOSE|SECTION)* >

<!ELEMENT PURPOSE (#PCDATA)* >
<!ELEMENT SECTION (HEADING|STATEMENT|SUBSECTION)* >
<!ATTLIST SECTION NUMBER CDATA #IMPLIED>

<!ELEMENT HEADING (#PCDATA|SHORTTITLE)* >
<!ELEMENT SHORTTITLE (#PCDATA)* >

<!ELEMENT STATEMENT (#PCDATA | AMENDMENT | SECTION | ATTESTATION |
TEXT)* >
<!ELEMENT AMENDMENT (CODE|STRIKEOUT|INSERT|REDESIGNATE)* >
<!ELEMENT CODE (#PCDATA)* >
<!ELEMENT STRIKEOUT (#PCDATA)* >
<!ELEMENT INSERT (#PCDATA|PARAGRAPH|SUBSECTION|INSERT)* >
<!ELEMENT PARAGRAPH (TOPIC|TEXT|PARAGRAPH)* >
<!ATTLIST PARAGRAPH NUMBER CDATA #IMPLIED>

<!ELEMENT SUBSECTION (TOPIC|PARAGRAPH)* >
<!ATTLIST SUBSECTION NUMBER CDATA #IMPLIED>

<!ELEMENT TOPIC (#PCDATA)* >
<!ELEMENT TEXT (#PCDATA)* >
<!ELEMENT REDESIGNATE (#PCDATA)* >
<!ELEMENT ATTESTATION (#PCDATA)* >
```

FIGURE 26

<!ELEMENT STATEMENT (#PCDATA | AMENDMENT | SECTION | ATTESTATION | TEXT)* >

FIGURE 27

```
<DOCUMENT DOCID="f:hc148eas.txt" REFERENCENUMBER = "H. CON. RES. 148"
CLASS="Concurrent Resolution">
<CONGRESS>
  <NUMBER>104th CONGRESS</NUMBER>
  <SESSIONNUMBER>2d Session</SESSIONNUMBER>
  <BODYOFCONGRESS>Senate of the United States</BODYOFCONGRESS>
  <DATE>March 21, 1996</DATE>
</CONGRESS>
<RESOLUTION>
  <TYPE>AMENDMENTS</TYPE>
  <STATEMENT>
    <OPENING>
      Resolved, That the resolution from the House of Representatives (H. Con.
      Res. 148) entitled "Concurrent resolution expressing the sense of the
      Congress that the United States is committed to military stability in the
      Taiwan Strait and the United States should assist in defending the
      Republic of China (also known as Taiwan) in the event of invasion,
      missile attack, or blockade by the People's Republic of China.", do pass
      with the following
    </OPENING>
    <STRIKEOUT>Strike out all after the resolving clause
    </STRIKEOUT>
    <INSERT>
      That it is the sense of the Congress—
      (1) to deplore the missile tests and military exercises that the
      People's Republic of China is conducting from March 8 through March 25,
      1996, and view such tests and exercises as potentially serious threats to
      the peace, security, and stability of Taiwan and not in the spirit of the
      three United States-China Joint Communiques;
      (2) to urge the Government of the People's Republic of China to cease
      its bellicose actions directed at Taiwan and enter instead into
      meaningful dialogue with the Government of Taiwan at the highest levels,
      such as through the Straits Exchange Foundation in Taiwan and the
      Association for Relations Across the Taiwan Strait in Beijing, with an
      eye towards decreasing tensions and resolving the issue of the future of
      Taiwan;
      (3) that the President should, consistent with section 3o of the
      Taiwan Relations Act of 1979 (22 U.S.C. 3302o), immediately consult with
      Congress on an appropriate United States response to the tests and
      exercises should the tests or exercises pose an actual threat to the
      peace, security, and stability of Taiwan; (4) that the President should,
      consistent with the Taiwan Relations Act of 1979 (22 U.S.C. 3301 et
      seq.), reexamine the nature and quantity of defense articles and services
      that may be necessary to enable Taiwan to maintain a sufficient self-
      defense capability in light of the heightened military threat; and
      (5) that the Government of Taiwan should remain committed to the
      peaceful resolution of its future relations with the People's Republic of
      China by mutual decision.
    </INSERT>
    <STRIKEOUT>Strike out the preamble</STRIKEOUT>
    <INSERT>
      Whereas the People's Republic of China, in a clear attempt to intimidate
      the people and Government of Taiwan, has over the past 9 months conducted
      a series of military exercises, including missile tests, within
      alarmingly close proximity to Taiwan;

      Whereas from March 8 through March 15, 1996, the People's Republic of
      China conducted a series of missile tests within 25 to 35 miles of the 2
      principal northern and southern ports of Taiwan, Kaohsiung and Keelung;
      Whereas on March 12, 1996, the People's Republic of China began an 8-day,
```

28A

28B

28C

FIGURE 28A

live-ammunition, joint sea-and-air military exercise in a 2,390 square mile area in the southern Taiwan Strait;

Whereas on March 18, 1996, the People's Republic of China began a 7-day, live-ammunition, joint sea-and-air military exercise between Taiwan's islands of Matsu and Wuchu;

Whereas these tests and exercises are a clear escalation of the attempts by the People's Republic of China to intimidate Taiwan and influence the outcome of the upcoming democratic presidential election in Taiwan; Whereas through the administrations of Presidents Nixon, Ford, Carter, Reagan, and Bush, the United States has adhered to a "One China" policy and, during the administration of President Clinton, the United States continues to adhere to the "One China" policy based on the Shanghai Communiqué of February 27, 1972, the Joint Communiqué on the Establishment of Diplomatic Relations Between the United States of America and the People's Republic of China of January 1, 1979, and the United States-China Joint Communiqué of August 17, 1982;

Whereas through the administrations of Presidents Carter, Reagan, and Bush, the United States has adhered to the provisions of the Taiwan Relations Act of 1979 (22 U.S.C. 3301 et seq.) as the basis for continuing commercial, cultural, and other relations between the people of the United States and the people of Taiwan and, during the administration of President Clinton, the United States continues to adhere to the provisions of the Taiwan Relations Act of 1979;

Whereas relations between the United States and the Peoples' Republic of China rest upon the expectation that the future of Taiwan will be settled solely by peaceful means; Whereas the strong interest of the United States in the peaceful settlement of the Taiwan question is one of the central premises of the three United States-China Joint Communiqués and was codified in the Taiwan Relations Act of 1979; Whereas the Taiwan Relations Act of 1979 states that peace and stability in the western Pacific "are in the political, security, and economic interests of the United States, and are matters of international concern";

Whereas the Taiwan Relations Act of 1979 states that the United States considers "any effort to determine the future of Taiwan by other than peaceful means, including by boycotts, or embargoes, a threat to the peace and security of the western Pacific area and of grave concern to the United States"; W

Whereas the Taiwan Relations Act of 1979 directs the President to "inform Congress promptly of any threat to the security or the social or economic system of the people on Taiwan and any danger to the interests of the United States arising therefrom";

Whereas the Taiwan Relations Act of 1979 further directs that "the President and the Congress shall determine, in accordance with constitutional process, appropriate action by the United States in response to any such danger";

Whereas the United States, the People's Republic of China, and the Government of Taiwan have each previously expressed their commitment to the resolution of the Taiwan question through peaceful means; and

Whereas these missile tests and military exercises, and the accompanying statements made by the Government of the People's Republic of China, call into serious question the commitment of China to the peaceful resolution of the Taiwan question: Now, therefore, be it.

</INSERT>
<CLOSING>

Amend the title so as to read: "Expressing the sense of Congress regarding missile tests and military exercises by the People's Republic of China."

FIGURE 28B

PERSISTENT ARCHIVES
Inventors: Reagan W. Moore, et al.
Howrey Docket No. 02737.0004.NPUS01
30/118

```
</CLOSING>  
</STATEMENT>  
</RESOLUTION>  
  
<ATTESTATION>Secretary</ATTESTATION>  
  
</DOCUMENT>
```

FIGURE 28C

Prefix	Meaning
h	House of Representatives
hc	House of Representatives concurrent resolution
hj	House of Representatives joint resolution
hr	House of Representatives resolution
s	Senate
sc	Senate concurrent resolution
sj	Senate joint resolution
sr	Senate resolution

FIGURE 29

Suffix	Count	Meaning
as	3	amendment in the Senate
ath	97	considered and agreed to in the House
ats	251	considered and agreed to in the Senate
cdh	6	considered in the House (and committed to a committee)
cds	1	considered in the Senate (and committed to a committee)
cph	19	considered and passed in the House
cps	20	considered and passed in the Senate
eah	36	resolved with amendments in the House
eas	115	resolved with amendments in the Senate
eh	887	enactment resolved in the House
es	270	enactment resolved in the Senate
enr	413	
hds	3	held at the desk in the Senate
ih	4947	introduced in the House
is	2271	introduced in the Senate
ips	4	indefinitely postponed in the Senate
lth	8	laid on the table in the House
pch	1	placed on calendar in the House
pcs	184	placed on calendar in the Senate
pp	31	ordered to be printed as passed
rch	8	re-referred to the same or a different committee in the House
rds	6	re-referred to the same or a different committee in the Senate
rds	187	received in the Senate
rfh	103	referred to a committee in the House
rih	1	referred to a committee for a limited time in the House
ris	44	referred to a committee for a limited time to report, or be discharged and placed on the calendar in the Senate
rh	742	report in the House
rs	471	report in the Senate
rh2	1	2-part report in the House
rs2	3	2-part report in the Senate
rth	1	referred to committee in the House
rts	5	referred to committee in the Senate
sc	1	

FIGURE 30

Record Type	TAG	AMICO-Field	Require ID?	Group	Definition/Guidelines	Parental File	Data Processing Requirement	Examples (Separated by ~)	Revision	Parental
Catalog	AID	AMICO Identifier	*	N	A unique identifier, assigned to a work in the AMICO Library. Comprised of a 4 letter institutional abbreviation, followed by a dot, and then a unique number such as an accession number [DOIs will be investigated in the future]		Validate. First 4 characters from Member Code Value Table followed by period	NMAA 87-32547(a-g)~ AIC_456502~ GEH_3457-86~		
Unique Identification										
What is it?										
Catalog	OTY	Object-Type		Y	The kind of work of art described; chosen from a short list of terms	AAT-Objects	Validate. Object Type Value Table.	Installation~ sculpture~ watercolor~		
Catalog	OPP	Object-Parts/Reces		Y	The number and a description of any parts/pieces of the work of art	AAT	no conditions	chair, shelf, painting on canvas, robe, and brids~ 3 panels~ 2~		
Catalog	QLG	Classification		Y	Does not contain data; used to group fields classifying work		Validate. Null value only.	~		
Catalog	QLT	Classification-Term		N	Terms used to associate this work with other like works	AAT	no conditions	sculptural multimedia installation~ works of art on paper	no repeat within group	#####
Catalog	QLS	Classification-Scheme		N	The classification scheme from which a term was chosen		no conditions. Construct Object Classification Scheme list	AAT~	no repeat within group	#####
What is it called?										
Catalog	OTG	Object-Title/Name	*	Y	Group element		Validate. Null value only.	~		

FIGURE 31A

31M	31L	31K	31J	31I	31H	31G	31F	31E	31D	31C	31B	31A
							31S	31R	31Q	31P	31O	31N

Catalog	OTN	Object-Title-Name	*	N	OTG	The title or name of the work	no conditions	In the Afternoon)~ untitle~ Blue #6	no repeat within group	####
Catalog	OTT	Title-Type		Y	OTG	The kind of Title or Name assigned to the work: Can include terms/phrases such as 'preferred', 'as given by artist', etc.	no conditions	preferred)~ popular)~ as first exhibited)~		
Catalog	OST	State		Y		For works produced in multiples, the state of this particular impression	no conditions	1 of 5)~ only known)~ artists proof		
Catalog	OEN	Edition		Y		For works produced in multiples, the edition of this particular example.	no conditions	1st)~ Second American)~		
What does it look like?										
Catalog	OPD	Physical Description		N		A narrative description of the physical appearance of the work including any parts or components.	no conditions	The objects are off center with a brick pathway leading towards them and the canvas in the background)~ Installation piece for the 2nd floor sculpture court comprised of several pine sticks. The ones in the center are burned)~		
Catalog	OPA	Physical Orientation/Arrangement		N		A narrative description of the orientation of the work, or its physical arrangement or set-up. For example, used to describe how to assemble an installation, or hang an oddly shaped or abstract work.	no conditions	horizontal)~ designed for 14'x28' room)~ on pedestal		
Catalog	MET	Measurements-Text	*	Y		A free text display form of the works measurements.	no conditions	14'x28')~ 17.6" x 38" unframed)~ 160 kg)~ 13.2 cu. m.		

FIGURE 31B

Catalog	MEG	Measurements			Y	Group	Does not contain data, used to group fields recording measurements.		Validate. Null value only.	~			
Catalog	MM	Measurement-Component-Measured			N	MEG	A term indicating what was measured (sheet, frame, lid, pedestal etc.)	AAT	no conditions	sheet}~ frame}~ lid}~ pedestal}~			
Catalog	MD	Measurement-Dimension			N	MEG	A term indicating the measurement taken, drawn from the following list: height, width, depth, weight, circumference, duration, volume (other terms may be added)		Validate. Dimensions Value Table.	height}~ width}~ length}~ circumference}~ diameter}~ volume}~ weight}~ duration}~			
Catalog	MDV	Measurement-Dimension-Value			N	MEG	The number of units of the measurement (numeric only)		Validate. Numeric	37.6}~ 14}~ 182.25			
Catalog	MDU	Measurement-Dimension-Units			N	MEG	The unit in which the measurement was taken: inches, feet, mm, cm, lbs., oz., kg, gr., minutes, sq. ft., cu. ft. etc.		Validate. Measurement Units Value Table	linear measurements: inches}~ ft}~ mm}~ cm}~ meters}~ planar measurements: sq.ft.}~ sq.m.}~ volumetric measurements: cu.ft. cu. meters}~ pounds, ounces}~ grams, kilograms}~ seconds, minutes}~ hours}~			
Catalog	MEQ	Measurement-Qualifier			N	MEG	A qualification or indication of the accuracy of a measurement		no conditions	plus/minus 10}~ accurate to 96%}~ circa}~	no repeat within group	#####	
Catalog	OMG	Materials and Techniques			Y	Group	Does not contain data, used to group fields documenting materials and techniques used to create the work.		Validate. Null value only.	~			
Catalog	OMD	Materials and Techniques-Description		*	N	OMG	A free text description of the materials and techniques used to create the work of art.	AAT		Brids, furniture and canvas}~ ink and watercolor on paper}~ oil on canvas}~			
Catalog	OMT	Materials and Techniques-Process/Technique-Term			Y	OMG	Single terms that index the processes and techniques used to create the work.	AAT	no conditions. look up in AAT Processes/Techniques Hierarchy	construction}~ freestand drawing}~ drip painting}~ lithograph			

FIGURE 31C

Catalog	OWM	Materials and Techniques- Materials-Term			Y	OMG	Single terms that index the materials used to create the work.	AAT	no conditions. look up in AAT Materials Hierarchy	brick}~ oak}~ watercolor}~ varnish}~		
Catalog	OMS	Materials and Techniques- Support			Y	OMG	Single terms that index the support on which the work was created.	AAT	no conditions. look up in AAT Materials Hierarchy	rice paper}~ canvas		
Catalog	OIN	Inscriptions and/or Marks			Y		A free text description or transcription of any inscriptions or marks on the work, including their location, medium, hand, and other details.		no conditions	signed, J.G., lower front}~ silver mark on handle}~ inscribed "to my friend John" on rear, with date July 14, 1973}~		
Catalog	OCH	Condition/Examination History			Y		A narrative description of the Condition or Examination history of the work of art. One documentation associated with Condition or Examination History in the Related Documents Group.		no conditions	Excellent Condition according to Condition Report, 14/7/82, H.M. Black, Conservator}~ not inspected when first accessioned, found to have scratch in upper left, 3 inches long, during 1965 inventory}~		
Catalog	OTH	Treatment/Conservation History			Y		A narrative description of the Treatment or Conservation of the Work of art. One Documentation associated with Treatment or Conservation in the Related Documents Group.		no conditions	Restored, summer 1987. Detailed treatment report available}~ Base reaffixed July 1987}~		
Who made it?												
Catalog	ORG	Creator			Y	Group	Does not contain data; used to group the fields documenting the creator of the work.		Validate. Null value only.			

FIGURE 31D

Catalog	CRQ	Creator- Qualifier			N	CRG	A qualification of the attribution of the work to a particular creator.		no conditions	School of~ Follower of~ Attributed to~ Copy after~		
Catalog	CRQ	Creator-Name- Text	*	*	N	CRG	Display form (direct order) of Creator Name (and qualifier). If Creator-Name isn't present, display form of Creator Culture Nationality	ULAN	no conditions	Vito Accorci~ W. Eugene Smith ~ Rembrandt van Rijn	no repeat within group	#####
Catalog	CRN	Creator-Name		*or CRG	N	CRG	Sort Form (inverted, last name first) of Creator name; used in indexing.	ULAN	Validate presence/ or presence of CRG	Accorci, Vito~ Smith, W. Eugene~ Rembrandt van Rijn		
Catalog	CRG	Creator- Culture/Nationality		* or CRN	N	CRG	The culture or nationality of the creator who made the work, or to which the creation of the work is attributed.	AAT	Validate presence, or presence of CRN	Benin Culture~ Egyptian 1085-710 B.C.~ Native American		
Catalog	ODT	Creator- Dates/Locations- Text			N	CRG	A free text description of dates and places associated with the creator or culture that created the work.	TGN	no conditions. Parse Numeric years to identify begin and end dates, BC., and qualifiers	born 1876 in Staffordshire, England~ after 800 B.C.~ not before 1766~ c.1450~ 3rd century B.C.~ Died 1990		
Catalog	ODD	Creator-Birth- Date			N	CRG	The date of birth of the creator.	numeric	Validate: Numeric, Parse to Validate. YYYYMMDD	1957~ 19780914~ 190206~	renamed from CDB (typo originally)	#####
Catalog	ODP	Creator-Birth- Place			N	CRG	The place the creator was born.	TGN	no conditions.	Lille, France~ The Netherlands~ London, Ontario, Canada		
Catalog	ODQ	Creator-Birth- Qualifier			N	CRG	A free text qualifier of the date of birth of the creator.		Validate: Date Qualifier Value Table	c.~ circa~ before~ not after~ no later than~		
Catalog	ODD	Creator-Death- Date			N	CRG	The date the creator of the work died.	numeric	Validate: Numeric, Parse to Validate. YYYYMMDD	1320~ 19380914~ 710 B.C.~		

FIGURE 31E

Catalog	CDP	Creator-Death-Place				ORG	The place of death of the creator.	TGN	no conditions.	Helsinki, Finland~ India~ at sea, South Atlantic~		
Catalog	CDQ	Creator-Death-Qualifier				ORG	A free text (qualifier of the date of death of the creator.		Validate. Date Qualifier Value Table	c.~ circa~ before~ not after~ no later than~		
Catalog	CAD	Creator-Active-Date				ORG	The creator's dates of activity; may be known when birth and death are not.	numeric	no conditions	1342-1386~ 1960(s)~ early 7th century B.C.~		
Catalog	CAP	Creator-Active-Place				ORG	The place where the creator was active. May repeat with multiple places.	TGN	no conditions	France~ Middle Kingdom, Egypt~ North America~		
Catalog	CGN	Creator-Gender				ORG	the gender of the creator.	Male/Female	Validate. 'Male' or 'Female'	Male~ Female~	corrected M and F in validation to match examples.	#####
Catalog	CRB	Creator-Biography				ORG	A free text biography of the creator of the work.		no conditions	Active in Canada 1844-71; Came to Canada in 1842~ Winner of the Prix du Rome in 1903.		
Catalog	CRR	Creator-Role				ORG	A term or terms describing the role played by the creator in the making of the work of art.	AAT	no conditions. Construct Role Values list	sculptor~ designer~ print maker~ castings manager~		
Catalog	CNO	Creator-Notes				ORG	A free text note about the creator, and the relationship between the creator or culture and the work of art.		no conditions	Not known to have ever signed works.		
When was it made?	OCG	Creation-Dates				Group	Does not contain data; used to group fields dating works creation.		Validate. Null value only.			
Catalog	OCT	Creation-Date-Text		*	*	OCG	The date on which a work was created, or a range of dates during which it could have been created	Parse to Numeric equivalents	no conditions. Parse. Validate. Numeric years to identify begin and end dates, BC, and qualifiers	c. 1645~ 1957~ dated by the artist as September 13, 1975~		

FIGURE 31F

Catalog	OCS	Creation-Date-Start			N	OCG	A number, indicating the earliest possible date a work could have been created; BC dates are recorded as negative integers	numeric	Validate: Numeric Parse to Validate: YYYYMMDD	1300}~ 198209}~ 1946.103}~		
Catalog	OCE	Creation-Date-End			N	OCG	A number, indicating the latest possible date a work could have been created; BC dates are recorded as negative integers	numeric	Validate: Numeric Parse to Validate: YYYYMMDD	1350}~ 198301}~ 1946.103}~		
Catalog	OCQ	Creation-Date-Qualifier			N	OCG	A qualifier, that indicates approximation in the earliest or latest date.		Validate: Date Qualifier Value Table	c.}~ circa}~ before}~ not after}~ no later than}~		
Where was it made?												
Catalog	OCP	Creation-Place			Y		A place or places where the work was created.	TGN	no conditions. Lookup in TGN	Paris, France}~ Lone River Valley}~ Los Angeles, California, USA}~		
What is it about?												
Catalog	STG	Style/Period			Y	Group	Does not contain data; used to group fields describing work's style or period.		Validate: Null value only.	}~		
Catalog	STD	Style/Period-Description			N	STG	A narrative description of the style or period of the work of art.	AAT	no conditions. Parse terms from AAT Style and Periods to Style & Period Terms	Early Christian with Byzantine influence}~ Eastern Han ceramic ware with 13th century decorative glazes}~ Baroque}~ Etruscan influenced}~		
Catalog	STT	Style/Period-Terms			Y	STG	Index terms that characterize the style and/or period of the work of art.	AAT	no conditions. Look up in AAT Style & Periods	Art Nouveau}~ Mian ware}~ French Colonial}~		
Catalog	SUG	Subject Matter			Y	Group	Does not contain data; used to group fields documenting work's subject matter.		Validate: Null value only.	}~		

FIGURE 31G

Catalog	SUP	Subject Matter- Preliminary Description		N	SUG	A free text description of the generic subject of the work of art.	AAT	no conditions	Pastoral landscape with cattle in fields (in background)~ Full length portrait with ball gown and pearls~ Group of men at table gambling and drinking)~		
Catalog	SUI	Subject Matter- Iconography		Y	SUG	A free text description of the specific, named subject of the work of art		no conditions	Diana and hounds)~ Christ in the temple)~ Herod and the slaughter of the innocents)~		
Catalog	SUT	Subject Matter- Index Terms		Y	SUG	Index terms that characterize the subject of the work of art.	AAT	no conditions	Mrs. John Patonius)~ Court of Louis XIV)~ Netherlands - 16th century, Recreation)~		
Catalog	OIG	Context		Y	Group	Does not contain data; used to group fields documenting work's context.		Validate. Null value only.			
Catalog	OIO	Context- Description		N	OIG	A narrative description of the historical context of the work of art, including its creation, display, excavation, or other history.		no conditions	Excavated at Pompeii in the 1876 expedition)~ Installed in Brussels town square until 1782)~ Originally displayed with frame-like structure built by the artist as part of the Black3 series)~		
Catalog	OIP	Context- Related-Person		Y	OIG	Index forms of the names of any people contextually related to the work of art.	ULAN	no conditions.	Pershing, John)~ Emperor Hirohito)~ Wu Hen Din)~ Pope Julius II		
Catalog	OIS	Context- Related Site/Place		Y	OIG	The names of any places that are contextually related to the work of art.	TGN	no conditions.	Brussels, Belgium)~ Pompeii, Italy)~ Times Square, New York, New York, USA)~		
Catalog	OIT	Context-Time Period/Dates		N	OIG	The dates, times or periods of a particular context.		no conditions.	1876)~ 1782)~ prior to acquisition by the museum in 1956)~		

FIGURE 31H

Catalog	OCR	Critical Responses			Y	Narrative discussions of the critical reception or analysis of the work of art. Link any critical texts in the Related Documents Group.		no conditions	"Delightful! - A triumph. "Maravius, Hais, "In the Light of day", The New City News, January 7, 1987~		
Who showed it?	OEI	Exhibition or Loan History			Y	A record of when and where the work has been exhibited.			Manchester Museum of Art, June 10 - September 18, 1976, "New Lines in Grand Masters"		
Who owned it?	OOG	Owner			Y	Does not contain data; used to group fields documenting works ownership.		Validate. Null value only.	~		
Catalog	OON	Owner Name	*	*	N	The name of the institution or individual who owns the work now [e.g. the AMICO member]. Can repeat if multiple/part owners		no conditions	SF MOA~ The Trustees of the Harold J. Jameson Memorial Museum of Crafts~		
Catalog	OOP	Owner-Place		*	Y	The place where the work is owned.	TGN	no conditions	Buffalo, New York, USA~ St. Petersburg, Russia~ San Diego, Chile~		
Catalog	OOA	Owner-Accession-Number		*	Y	The accession or inventory number assigned to the work by this owner.		no conditions	87-4532.a-c~456565-0112~		
Catalog	OOC	Owner-Credit-Line	*	*	Y	The Credit Line, or any required mention or acknowledgement of the ownership of the work of art.		no conditions.	Gift of Mrs. John Francis Blue~ Purchased with funds from trustees and friends in memory of Hector Escobosa, Brayton Wilbur and J.D. Zellerbach~		

FIGURE 311

Catalog	OPO	Provenance/Prior Owners-Text		Y	A record of the past owners of the work of art.	no conditions	Andrew Carnegie~ ASEA International Ltd.~ Mr. & Mrs. John A. T. Pastors~		
Catalog	ORG	Rights/Copyright		Y	Does not contain data; used to group fields documenting work's copyright or restrictions.	Validate. Null value only.	~		
Catalog	ORS	Copyright-Statement	*	N	The copyright of the work of art, including any known rights holders, encumbrances or restrictions.	no conditions	Permission for educational use only granted by the Trustees of the Picasso estate~ No reproductions permitted under terms of the gift~		
Catalog	ORL	Copyright-Link		N	A URL that links to the AMICO member, indicating where and how a user can acquire further information or rights to use the work.	Validate. Must be a url	http://www.artic.edu~		
What is it related to?									
Catalog	RWG	Related Works of Art		Y	Does not contain data; groups fields documenting related works of art.	Validate. Null value only.	~		
Catalog	RWD	Related-Works-Description		N	A narrative description of the relationship between this work and any others.	no conditions	David Hockney, "Mulholland Drive: the Road to the Studio", 1980~ Other statues from the same site accessioned by the British Museum in 1845~		
Catalog	RWR	Related-Works-Relationship-Type		N	The kind of relationship; drawn from the list of Dublin Core Relationship types.	Validate. DC Relations Type Value Table	IsBasisFor~ IsPartOf~ References~		

FIGURE 31J

Catalog	RWL	Related-Works- Identifier/Link			N	RWG	An identifier for or link to the related work of art.		Validate. AMICO Inst. Code, period, alpha-numeric	LAMA.AC1954.856.32)~ AKAG.1863:1)~		
Catalog	RIG	Related Images		*	Y	Group	Does not contain data; groups fields documenting related images. All AMICO works must have at least one related image.		Validate. Null value only.)~		
Catalog	RIP	Related-Image- Preferred		*	N	RIG	Indicates [yes/no] whether this is the preferred image of the work of art. Each work must have one preferred image, that will be used in lists and brief displays.	Y or N	Validate.	Y)~ N)~	no repeat within group	####
Catalog	RID	Related-Image- Description		*	N	RIG	The view of the work shown in this image: full, detail, recto, verso, 360 degrees, etc.; Note: Maps to XDE in Multimedia Metadata Record		Validate. Views Value Table	Detail)~ Full View)~ Aerial view)~ 360 degrees)~x-ray)~	no repeat within group	####
Catalog	RIR	Related-Image- Relationship- Type		*	N	RIG	The relation between this work and the image, using values from the Dublin Core Relationship Types. If original work is analog, and the image is digital, this value will be "HasFormat". If the original work is digital and the image is digital, this value is "HasVersion".	DC Relations	Validate. DC Relations Type Value Table	HasFormat)~ HasVersion)~		
Catalog	RIL	Related-Image- Identifier/Link		*	N	RIG	The identifier of the related image' Note: maps to XID in Multimedia Metadata Record		Validate. AMICO Inst. Code, period, alpha-numeric, period, 3 char. MIME Type from Value list	AIC_96-34543.tif~ SFMA.89- 2335.jpg)~		

FIGURE 31K

Catalog	RMG	Related Multimedia				Y	Group	Does not contain data; groups fields documenting related multimedia files.		Validate: Null value only.	~			
Catalog	RMD	Related-Multimedia-Description				N	RMG	A description of the related multimedia file. Note: Maps to XDE in Multimedia Metadata Record		no conditions		Interview, in the artist's studio, January 17, 1993~ "Fly-Through" movie of the installation seen from three feet above ground~ Interpretation offered by the Museum Director in the gallery audio~		
Catalog	RMR	Related-Multimedia-Relationship-Type				N	RMG	The relationship between this work and the related multimedia file, expressed using Dublin Core Relationship Types. Note: Inverse in XRT of Multimedia Metadata Record	DC Relations	Validate: DC Relations Type Value Table	References~ IsVersionOf~ IsBasedOn~			
Catalog	RML	Related-Multimedia-Identifier/Link				N	RMG	The identifier of the related multimedia file. Note: maps to XID in Multimedia Metadata Record		Validate: AMICO Inst. Code, period, alpha-numeric, period, 3 char. MIME Type from Value list	SFMA.96-543.mov~ SDCA.1324:87.1.wav~ NMAA.67-3452.cgm~			
Catalog	RDG	Related Documents				Y	Group	Does not contain data; groups fields describing related documents.		Validate: Null value only.	~			
Catalog	RDD	Related-Document-Description				N	RDG	The description, or title with full citation, of the related document. Note: Maps to XDE in Multimedia Metadata Record		no conditions		Johnson, James, "Major Works by Hungarian Artists, London, Ballet & Baney, 1963 p.137-138~ The New Reporter, "ARTOpenARTclosed", June 17, 1989, p.7~ transcript of gallery talk at opening, Museum Archives~		

FIGURE 31L

Catalog	RDR	Related-Document-Relationship-Type		N	RDG	A description of the relationship between the work and the related document, expressed using Dublin Core Relationship Types. Note: Inverse of XRT in Multimedia Metadata Record	DC Relations	Validate. DC Relations Type Value Table	References		
Catalog	RDL	Related-Document-Identifier/Link		N	RDG	The Identifier of the Related Document. Note: maps to XID in Multimedia Metadata Record		Validate. AMICO Inst. Code, period, alpha-numeric, period, 3 char. MIME Type from Value list	WGA_doc1876-45.sgm)~ MIA_newreporter46.gif~ NMAA_Ex85-342.bt~		
Who documented it?											
Catalog	DCG	Documentation/Cataloging-History		Y	Group	Does not contain data; groups fields recording the documentation history of the work		Validate. Null value only.	~	Tag changed from DCH to make consistent with other group tags	#####
Catalog	DCB	Documented/Cataloged By		N	DCG	The name of the person who documented the work.		no conditions.	Jameson)~ PDT)~ PhotoServices3)~	no repeat within group	#####
Catalog	DCD	Documented/Cataloged-Date		N	DCG	The date the work was documented.	date	Validate. YYYYMMDD	19870415)~	no repeat within group	#####

FIGURE 31M

Version Control?	AMICO-Validated Date	*	N	Entered by AMICO. The date the catalog record for a work of art was validated; created by AMICO	date	Validate. YYYYMMDD	19980324}~19980214}~		
Catalog	AW	*	N	Entered by AMICO. The version of the AMICO data dictionary in which the work is documented.	numeric	Validate. Numeric	1.0}~1.3}~2.1}~		
Catalog	ADP		Y	Entered by AMICO. A record of any data processing or parsing done by AMICO; includes notes of errors, warnings, and additions through parsing routines.			measurement data parsed; Error - OCT is a required field!		
Catalog	DEL		N	Entered by AMICO. Indicates that a record should be removed from all public distributions of the library. Y=deleted record	flag Y/N		Y~	added field that tracks record deletion	#####
Catalog	ALY		N	Entered by AMICO. Indicates which library year this record was originally received in.	numeric	Validate. Numeric-4 digits exactly	1998}~1999}~	added field to track when record was originally submitted	#####

FIGURE 31N

Media Metadata	XID	DC.Resource.Identifier	*	N	The identifier of the metadata file. Maps to RIL, RML or RDL in catalog record. Validation ensures conformity to file naming conventions	Validate.	MMA_39504.TIF AUC_MJMB88.MOV		
Media Metadata	XTI	DC.Title		Y	The title or name of the work in the media file; maps to RIL, RML, or RDL in the catalog record.		Front view		
Media Metadata	XCN	DC.Creator		Y	Does not contain data; groups fields documenting the creation of the media file.				
Media Metadata	XCP	DC.Creator.PersonalName		Y	The Personal Name of the creator of media file				
Media Metadata	XCC	DC.Creator.CorporateName		Y	The Corporate Name of the Creator of the media file.				
Media Metadata	XCR	DC.Creator.Role		Y	The role the named creator played in the making of the media file.				

FIGURE 310

Media Metadata	XDE	DC.Description	*	Y	A narrative description of the contents of the media file.								
Media Metadata	XPU	DC.Publisher	*	N	The name of the institution that made the media file available; i.e. the name of the contributing AMICO member.					Art Institute of Chicago			
Media Metadata	XDN	DC.Contributor		Y	Does not contain data; groups fields documenting other contributions to the creation of the media file.								
Media Metadata	XDP	DC.Contributor. PersonalName		Y	The Personal Name of a contributor to the creation of the media file								
Media Metadata	XDC	DC.Contributor. CorporateName		Y	The Corporate Name of a contributor to the creation of the media file.								
Media Metadata	XDR	DC.Contributor. Role		Y	The role played by the contributor in the creation of the media file.								
Media Metadata	XDA	DC.Date		Y	The date that the media file was created, in the format YYYYMMDD				Validate.				

FIGURE 31P

Media Metadata	XRT	DC.ResourceType	*	N	A "genre-like" term, characterizing the content of the media file. For example, analytical report; critical review; interview; letter; lecture; portrait; reproduction;		reproduction		
Media Metadata	XAM	AMICO.Mode	*	N	A term indicating the modality in which a person will experience the resource. audio; image; model; multimedia; text; video	Validate.	image		
Media Metadata	XFO	DC.Format		Y	Not Used: AMICO records format in specific sub-elements.		group tag	#####	
Media Metadata	XFE	AMICO.Format.Encoding	*	N	The manner in which the data in the media file is encoded. E.g. gif; tiff; jif; ascii	Validate.	TIFF	group tag added - part of XFO - corrected TIFF in example	#####
Media Metadata	XFP	AMICO.Format.ColorPalette		N	The color palette of the media file. E.g. RGB, CMYK, Grayscale		RGB	group tag added - part of XFO	#####
Media Metadata	XCM	AMICO.Format.ColorMetric		N	The manner in which the color data is represented; e.g., 24-bit, 8-bit.		24-bit	group tag added - part of XFO	#####
Media Metadata	XFD	AMICO.Format.Dimensions	*	N	The dimensions of the media file: For an image, the spatial resolution of the image, e.g. 1024 x 768; 640 x 480; etc.		1024 x 768	group tag added - part of XFO	#####

FIGURE 31Q

Media Metadata	XFF	AMICO.Format FileSize		*	N	XFO	The storage size of the media file.			2.7 MB.	group tag added - part of XFO	#####
Media Metadata	XFC	AMICO.Format Compression		*	N	XFO	The compression algorithm used in storing the media file: none; jpeg; mpeg; etc.	Validate.		JPEG~ MPEG~ QT~	group tag added - part of XFO -- corrected delimiters in examples	#####
Media Metadata	XRE	DC.Relation			Y	Group	Does not contain data; used to group fields documenting relationships.					#####
Media Metadata	XRY	DC.Relation.Type		*	N	XRE	The kind of relationship, expressed as a Dublin Core Relationship type. Note: this is the inverse of the relation in the record pointed to by the Relation.Identifier.	DC Relations		IsFormatOf~ IsVersionOf~		
Media Metadata	XRI	DC.Relation.Identifier		*	N	XRE	The identifier of the related work, image, metadata or sound; If within the AMICO Library, this must conform to naming conventions; warning produced if points outside AMICO dataset.	Validate.		AGO_253846v		
Media Metadata	XRS	DC.Rights	*	*	Y		Text of rights statement for this media file.			Copyright Art Institute of Chicago		
Media Metadata	XVN	AMICO.Media.Note			N		Capture details and other matters of importance for understanding the quality/content of the digital file.					

FIGURE 31R

Media Metadata	XVD	AMICO Metadata Validation Date	*	N	Added by AMICO: Date the file was validated	Validate.	19980506			
Media Metadata	XW	AMICO Data Dictionary Version	*	N	Version of the Data Dictionary	numeric	1			
Media Metadata	XPR	Metadata Data Processing Note	*	Y	Added by AMICO: Documents data processing routines, errors and additions through parsing routines		WARNING: XRI does not point to a valid AID	Can repeat	#####	
Media Metadata	XDL	Metadata Deletion Flag		N	Entered by AMICO. Indicates that a record should be removed from all public distributions of the library. Y=deleted record	flag Y/N	Y	add field that tracks record status (deleted?)	#####	
Media Metadata	XLY	Metadata Library Year		N	Entered by AMICO. Indicates which library year this record was originally received in.	numeric	1998	add field that tracks which library year record was submitted in.	#####	
Deleted Fields										
Catalog Record	OLC	Object Label Copy						not used consistently - existing data transferred to OLC	#####	

FIGURE 31S

<!--
 =====
 Auth
 \$Id: :
 =====

1. COMBINES amico-objects.dtd and amico-media.dtd into a SINGLE DTD.

2. Defines an ADDITIONAL LEVEL on top of the AMICO elements, corresponding to the abstract classification of AMICO elements in the data dictionary:

```

am_classification?, What is it?
am_titles,          What is it called?
am_appearance?,     What does it look like?
am_creators,        Who made it?
am_creation_date,    When was it made?
am_creation_place?,  Where was it made?
am_context?,        What is it about?
am_criticism?,      What does it mean?
am_exhibitions?,    Who showed it?
am_owners,          Who owned it?
am_related_works,   What is it related to?
am_documenters?,    Who documented it?
am_version_control?, Version Control?
am_media_metadata    Media Metadata
  
```

=====

NAMING CONVENTIONS FOR ELEMENTS:

The AMICO data dictionary has a

- o TAG column defining a 3-letter abbreviation, and a
- o AMICO-FIELD column with the full name of the field.

These two components make up the XML tag name as follows:

- o XYZ__AMICO_FIELD_NAME

For elements which are *groups*, i.e., contain subelements, just one underscore is used.

Example:

```

o CLG_classification      (group)
o OTY__object_type        (atomic element)
  
```

NOTE: OLC is not modeled, as it is listed under 'deleted fields'

=====

MULTIPLICITY OF ELEMENTS IN DTDs:

```

* = zero-or-more
+ = one-or-more
? = zero-or-one
otherwise: exactly one
  
```

NOTE: OLC is not modeled, as it is listed under 'deleted fields'

| |
|-----|
| 32A |
| 32B |
| 32C |
| 32D |
| 32E |
| 32F |
| 32G |
| 32H |
| 32I |
| 32J |
| 32K |

FIGURE 32A

===== -->

<!ELEMENT am_objects (am_object*) >

<!ELEMENT am_object (
 AID__amico_identifier,
 am_classification?,
 am_titles,
 am_appearance?,
 am_creators,
 am_creation_dates,
 am_creation_place?,
 am_context?,
 am_criticism?,
 am_exhibitions?,
 am_owners,
 am_related_works?,
 am_documenters?,
 am_version_control?,
 am_media_metadata
)>

<!ELEMENT am_classification (
 OTY__object_type*,
 OPP__object_parts_pieces*,
 CLG_classification*
)>

<!ELEMENT CLG_classification (
 CLS__classification_scheme?,
 CLT__classification_term?
)>

<!ELEMENT am_titles (
 OTG_object_title_name+,
 OST__state*,
 OEN__edition*
)>

<!ELEMENT OTG_object_title_name (
 OTN__object_title_name?,
 OTT__title_type*
)>

FIGURE 32B

```
<!ELEMENT am_appearance (  
    OPD__physical_description?,  
    OPA__physical_orientation_arrangement?,  
    MET__measurements_text*,  
    MEG__measurements*,  
    OMG__materials_and_techniques*,  
    OIN__inscriptions_and_or_marks*,  
    OCH__condition_examination_history*,  
    OTH__treatment_conservation_history*  
)>  
  
<!ELEMENT MEG_measurements (  
    MCM__measurement_component_measured?,  
    MED__measurement_dimension?,  
    MDV__measurement_dimension_value?,  
    MDU__measurement_dimension_units?,  
    MEQ__measurement_qualifier?  
)>  
  
<!ELEMENT OMG_materials_and_techniques (  
    OMD__materials_and_techniques_description?,  
    OMT__materials_and_techniques_process_technique_term*,  
    OMM__materials_and_techniques_materials_term*,  
    OMS__materials_and_techniques_support*  
)>  
  
<!ELEMENT am_creators (  
    CRG__creator*  
)>  
  
<!ELEMENT CRG_creator (  
    CRQ__creator_qualifier?,  
    CRT__creator_name_text,  
    CRN__creator_name?,  
    CRC__creator_culture_nationality?,  
    CDT__creator_dates_locations_text?,  
    CBD__creator_birth_date?,  
    CBP__creator_birth_place?,  
    CBQ__creator_birth_qualifier?,  
    CDD__creator_death_date?,  
    CDP__creator_death_place?,  
    CDQ__creator_death_qualifier?,  
    CAD__creator_active_date?,  
    CAP__creator_active_place*,  
    CGN__creator_gender?,  
    CRB__creator_biography?,  
    CRR__creator_role*,  
    CNO__creator_notes?  
)>
```

FIGURE 32C

```
<!ELEMENT am_creation_dates (
    OCG_creation_dates*
)>

<!ELEMENT OCG_creation_dates (
    OCT__creation_date_text,
    OCS__creation_date_start?,
    OCE__creation_date_end?,
    OCQ__creation_date_qualifier?
)>

<!ELEMENT am_creation_place (
    OCP__creation_place*
)>

<!ELEMENT am_context (
    STG_style_period*,
    SUG_subject_matter*,
    CXG_context*
)>

<!ELEMENT STG_style_period (
    STD__style_period_description?,
    STT__style_period_terms*
)>

<!ELEMENT SUG_subject_matter (
    SUP__subject_matter_preiconographic_description?,
    SUI__subject_matter_iconography*,
    SUT__subject_matter_index_terms*
)>

<!ELEMENT CXG_context (
    CXD__context_description?,
    CXP__context_related_person*,
    CXS__context_related_site_place*,
    CXT__context_time_period_dates?
)>

<!ELEMENT am_criticism (
    OCR__critical_responses*
)>

<!ELEMENT am_exhibitions (
    OEH__exhibition_or_loan_history*
)>

<!ELEMENT am_owners (
    OOG_owner*,
    OPO__provenance_prior_owners_text*,
    ORG_rights_copyright*
)>
```

FIGURE 32D

```
<!ELEMENT OOG_owner (  
    OON__owner_name,  
    OOP__owner_place*,  
    OOA__owner_accession_number*,  
    OOC__owner_credit_line+  
)>  
  
<!ELEMENT ORG_rights_copyright (  
    ORS__copyright_statement,  
    ORL__copyright_link?  
)>  
  
<!ELEMENT am_related_works (  
    RWG_related_works_of_art*,  
    RIG_related_images*,  
    RMG_related_multimedia*,  
    RDG_related_documents*  
)>  
  
<!ELEMENT RWG_related_works_of_art (  
    RWD__related_works_description?,  
    RWR__related_works_relationship_type?,  
    RWL__related_works_identifier_link?  
)>  
  
<!ELEMENT RIG_related_images (  
    RIP__related_image_preferred?,  
    RID__related_image_description?,  
    RIR__related_image_relationship_type?,  
    RIL__related_image_identifier_link?  
)>  
  
<!ELEMENT RMG_related_multimedia (  
    RMD__related_multimedia_description?,  
    RMR__related_multimedia_relationship_type?,  
    RML__related_multimedia_identifier_link?  
)>  
  
<!ELEMENT RDG_related_documents (  
    RDD__related_document_description?,  
    RDR__related_document_relationship_type?,  
    RDL__related_document_identifier_link?  
)>  
  
<!ELEMENT am_documenters (  
    DCG_documentation_cataloguing_history*  
)>  
  
<!ELEMENT DCG_documentation_cataloguing_history (  
    DCB__documented_cataloged_by?,  
    DCD__documented_cataloged_date?  
)>
```

FIGURE 32E


```
<!ELEMENT am_version_control (
    AVD__amico_validated_date?,
    AVV__validation_dictionary_version?,
    ADP__amico_data_processing*,
    DEL__amico_deletion_flag?,
    ALY__amico_library_year?
)>

<!-- ===== MEDIA METADATA ===== --
>

<!ELEMENT am_media_metadata (
    XID__dc_resource_identifier?,
    XTI__dc_title*,
    XCN__dc_creator*,
    XDE__dc_description*,
    XPU__dc_publisher?,
    XDN__dc_contributor*,
    XDA__dc_date*,
    XRT__dc_resourcetype?,
    XAM__amico_mode?,
    XFO__dc_format*,
    XRE__dc_relation*,
    XRS__dc_rights+,
    XMN__amico_media_note?,
    XVD__amico_metadata_validation_date?,
    XVV__amico_data_dictionary_version?,
    XPR__metadata_data_processing_note*,
    XDL__metadata_deletion_flag?,
    XLY__metadata_library_year?
)>

<!ELEMENT XCN__dc_creator (
    XCP__dc_creator_personalname*,
    XCC__dc_creator_corporatename*,
    XCR__dc_creator_role*
)>

<!ELEMENT XDN__dc_contributor (
    XDP__dc_contributor_personalname*,
    XDC__dc_contributor_corporatename*,
    XDR__dc_contributor_role*
)>

<!ELEMENT XFO__dc_format (
    XFE__amico_format_encoding?,
    XFP__amico_format_colorpalette?,
    XCM__amico_format_colormetric?,
    XFD__amico_format_dimensions?,
    XFF__amico_format_filesize?,
    XFC__amico_format_compression?
)>
```

FIGURE 32F

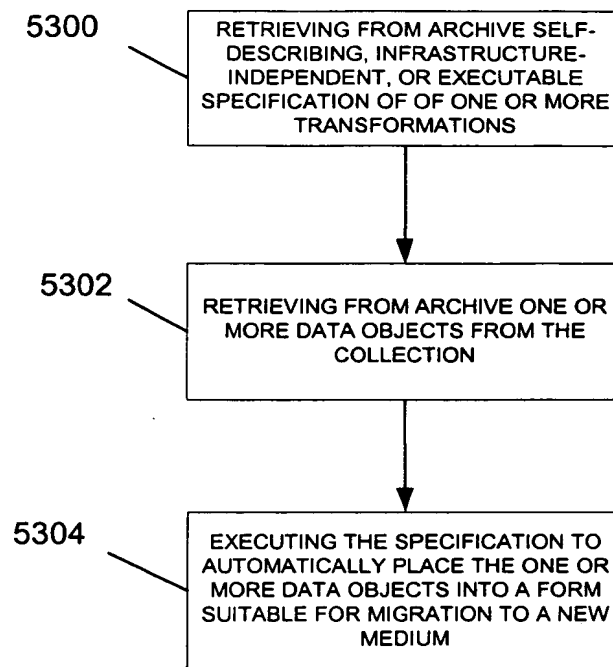


FIGURE 53

```
<!ELEMENT XRE_dc_relation (  
    XRY__dc_relation_type?,  
    XRI__dc_relation_identifier?  
)>
```

```
<!-- ===== ATOMIC ELEMENTS ===== -->
```

```
<!ELEMENT ADP__amico_data_processing  
    (#PCDATA)>  
<!ELEMENT AID__amico_identifier  
    (#PCDATA)>  
<!ELEMENT ALY__amico_library_year  
    (#PCDATA)>  
<!ELEMENT AVD__amico_validated_date  
    (#PCDATA)>  
<!ELEMENT AVV__validation_dictionary_version  
    (#PCDATA)>  
<!ELEMENT CAD__creator_active_date  
    (#PCDATA)>  
<!ELEMENT CAP__creator_active_place  
    (#PCDATA)>  
<!ELEMENT CBD__creator_birth_date  
    (#PCDATA)>  
<!ELEMENT CBP__creator_birth_place  
    (#PCDATA)>  
<!ELEMENT CBQ__creator_birth_qualifier  
    (#PCDATA)>  
<!ELEMENT CDD__creator_death_date  
    (#PCDATA)>  
<!ELEMENT CDP__creator_death_place  
    (#PCDATA)>  
<!ELEMENT CDQ__creator_death_qualifier  
    (#PCDATA)>  
<!ELEMENT CDT__creator_dates_locations_text  
    (#PCDATA)>  
<!ELEMENT CGN__creator_gender  
    (#PCDATA)>  
<!ELEMENT CLS__classification_scheme  
    (#PCDATA)>  
<!ELEMENT CLT__classification_term  
    (#PCDATA)>  
<!ELEMENT CNO__creator_notes  
    (#PCDATA)>  
<!ELEMENT CRB__creator_biography  
    (#PCDATA)>  
<!ELEMENT CRC__creator_culture_nationality  
    (#PCDATA)>  
<!ELEMENT CRN__creator_name  
    (#PCDATA)>  
<!ELEMENT CRQ__creator_qualifier  
    (#PCDATA)>  
<!ELEMENT CRR__creator_role
```

FIGURE 32G

```
<!ELEMENT CRT__creator_name_text
                                (#PCDATA)>
<!ELEMENT CXD__context_description
                                (#PCDATA)>
<!ELEMENT CXP__context_related_person
                                (#PCDATA)>
<!ELEMENT CXS__context_related_site_place
                                (#PCDATA)>
<!ELEMENT CXT__context_time_period_dates
                                (#PCDATA)>
<!ELEMENT DCB__documented_cataloged_by
                                (#PCDATA)>
<!ELEMENT DCD__documented_cataloged_date
                                (#PCDATA)>
<!ELEMENT DEL__amico_deletion_flag
                                (#PCDATA)>
<!ELEMENT
MCM__measurement_component_measured
                                (#PCDATA)>
<!ELEMENT MDU__measurement_dimension_units
                                (#PCDATA)>
<!ELEMENT MDV__measurement_dimension_value
                                (#PCDATA)>
<!ELEMENT MED__measurement_dimension
                                (#PCDATA)>
<!ELEMENT MEQ__measurement_qualifier
                                (#PCDATA)>
<!ELEMENT MET__measurements_text
                                (#PCDATA)>
<!ELEMENT OCE__creation_date_end
                                (#PCDATA)>
<!ELEMENT OCH__condition_examination_history
                                (#PCDATA)>
<!ELEMENT OCP__creation_place
                                (#PCDATA)>
<!ELEMENT OCQ__creation_date_qualifier
                                (#PCDATA)>
<!ELEMENT OCR__critical_responses
                                (#PCDATA)>
<!ELEMENT OCS__creation_date_start
                                (#PCDATA)>
<!ELEMENT OCT__creation_date_text
                                (#PCDATA)>
<!ELEMENT OEH__exhibition_or_loan_history
                                (#PCDATA)>
<!ELEMENT OEN__edition
                                (#PCDATA)>
<!ELEMENT OIN__inscriptions_and_or_marks
                                (#PCDATA)>
```

FIGURE 32H

<!ELEMENT OMD__materials_and_techniques_description
(#PCDATA)>
<!ELEMENT OMM__materials_and_techniques_materials_term
(#PCDATA)>
<!ELEMENT OMS__materials_and_techniques_support
(#PCDATA)>
<!ELEMENT OMT__materials_and_techniques_process_technique_term
(#PCDATA)>
<!ELEMENT OOA__owner_accession_number
(#PCDATA)>
<!ELEMENT OOC__owner_credit_line
(#PCDATA)>
<!ELEMENT OON__owner_name
(#PCDATA)>
<!ELEMENT OOP__owner_place
(#PCDATA)>
<!ELEMENT OPA__physical_orientation_arrangement
(#PCDATA)>
<!ELEMENT OPD__physical_description
(#PCDATA)>
<!ELEMENT OPO__provenance_prior_owners_text
(#PCDATA)>
<!ELEMENT OPP__object_parts_pieces
(#PCDATA)>
<!ELEMENT ORL__copyright_link
(#PCDATA)>
<!ELEMENT ORS__copyright_statement
(#PCDATA)>
<!ELEMENT OST__state
(#PCDATA)>
<!ELEMENT OTH__treatment_conservation_history
(#PCDATA)>
<!ELEMENT OTN__object_title_name
(#PCDATA)>
<!ELEMENT OTT__title_type
(#PCDATA)>
<!ELEMENT OTY__object_type
(#PCDATA)>
<!ELEMENT RDD__related_document_description
(#PCDATA)>
<!ELEMENT RDL__related_document_identifier_link
(#PCDATA)>
<!ELEMENT RDR__related_document_relationship_type
(#PCDATA)>
<!ELEMENT RID__related_image_description
(#PCDATA)>
<!ELEMENT RIL__related_image_identifier_link
(#PCDATA)>
<!ELEMENT RIP__related_image_preferred
(#PCDATA)>

FIGURE 32I

```
<!ELEMENT RIR__related_image_relationship_type
      (#PCDATA)>
<!ELEMENT RMD__related_multimedia_description
      (#PCDATA)>
<!ELEMENT RML__related_multimedia_identifier_link
      (#PCDATA)>
<!ELEMENT RMR__related_multimedia_relationship_type
      (#PCDATA)>
<!ELEMENT RWD__related_works_description
      (#PCDATA)>
<!ELEMENT RWL__related_works_identifier_link
      (#PCDATA)>
<!ELEMENT RWR__related_works_relationship_type
      (#PCDATA)>
<!ELEMENT STD__style_period_description
      (#PCDATA)>
<!ELEMENT STT__style_period_terms
      (#PCDATA)>
<!ELEMENT SUI__subject_matter_iconography
      (#PCDATA)>
<!ELEMENT SUP__subject_matter_preiconographic_description
      (#PCDATA)>
<!ELEMENT SUT__subject_matter_index_terms
      (#PCDATA)>
<!-- ===== MEDIA METADATA ===== -->

<!ELEMENT XAM__amico_mode
      (#PCDATA)>
<!ELEMENT XCC__dc_creator_corporatename
      (#PCDATA)>
<!ELEMENT XCM__amico_format_colormetric
      (#PCDATA)>
<!ELEMENT XCP__dc_creator_personalname
      (#PCDATA)>
<!ELEMENT XCR__dc_creator_role
      (#PCDATA)>
<!ELEMENT XDA__dc_date
      (#PCDATA)>
<!ELEMENT XDC__dc_contributor_corporatename
      (#PCDATA)>
<!ELEMENT XDE__dc_description
      (#PCDATA)>
<!ELEMENT XDL__metadata_delition_flag
      (#PCDATA)>
<!ELEMENT XDP__dc_contributor_personalname
      (#PCDATA)>
<!ELEMENT XDR__dc_contributor_role
      (#PCDATA)>
<!ELEMENT XFC__amico_format_compression
      (#PCDATA)>
<!ELEMENT XFD__amico_format_dimensions
      (#PCDATA)>
```

FIGURE 32J

<!ELEMENT XFE__amico_format_encoding
(#PCDATA)>
<!ELEMENT XFF__amico_format_filesize
(#PCDATA)>
<!ELEMENT XFP__amico_format_colorpalette
(#PCDATA)>
<!ELEMENT XID__dc_resource_identifier
(#PCDATA)>
<!ELEMENT XLY__metadata_library_year
(#PCDATA)>
<!ELEMENT XMN__amico_media_note
(#PCDATA)>
<!ELEMENT XPR__metadata_data_processing_note
(#PCDATA)>
<!ELEMENT XPU__dc_publisher
(#PCDATA)>
<!ELEMENT XRI__dc_relation_identifier
(#PCDATA)>
<!ELEMENT XRS__dc_rights
(#PCDATA)>
<!ELEMENT XRT__dc_resourcetype
(#PCDATA)>
<!ELEMENT XRY__dc_relation_type
(#PCDATA)>
<!ELEMENT XTI__dc_title
(#PCDATA)>
<!ELEMENT XVD__amico_metadata_validation_date
(#PCDATA)>
<!ELEMENT XVV__amico_data_dictionary_version
(#PCDATA)>

FIGURE 32K

64/118

TAGGED
XML

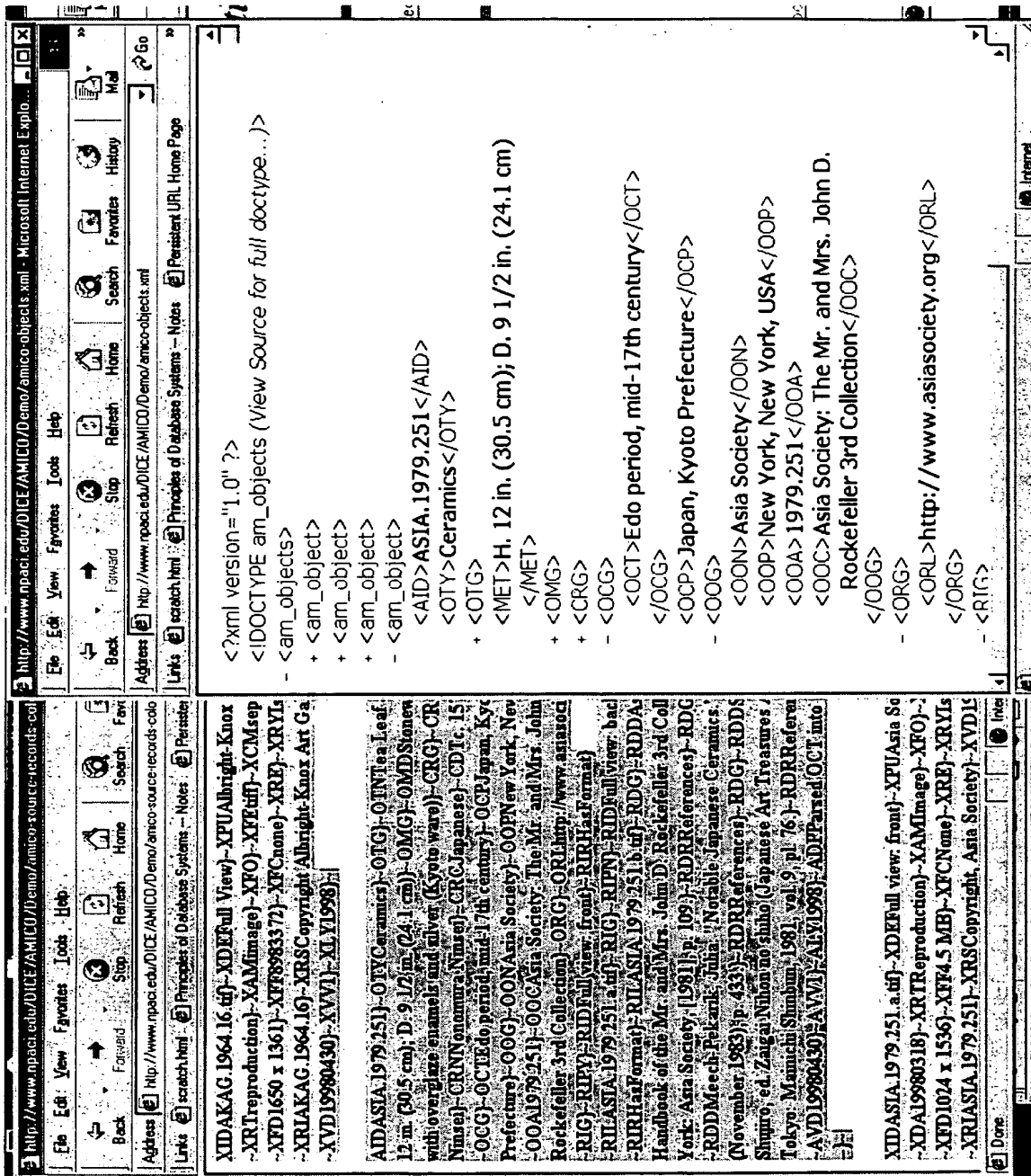


FIGURE 33

RAW DATA
RECORD

APPLICATION OF XSL STYLE SHEETS

2. XSL Style Sheet Script

```
<tr>  
  <td>weight: bold; text-decoration: underline</td>  
</tr>  
<tr>  
  <td>select: am_objects/am_object</td>  
</tr>  
<tr>  
  <td>order-by= "AID"></td>  
</tr>  
<tr>  
  <td></xsl:template></td>  
</tr>  
</xsl:stylesheet>
```

1. AMICO XML Data

```
<?xml version="1.0" ?>  
<!DOCTYPE am_objects [View Source for full  
doctype...]>  
<am_objects>  
  <am_object>  
    <AID>AGO_95/143</AID>  
    <OTY>Painting</OTY>  
    <OTG>  
      <OTN>The Bottle between the  
        Israelites and the  
        Amalekites</OTN>  
    </OTG>  
    <OPD />  
    <MDV>152.5cmx210.5cm</MDV>  
    <MEG>  
      <MED>height</MED>  
      <MDV>152.5</MDV>  
      <MDU>cm</MDU>  
    </MEG>  
    <MEG>  
      <MED>width</MED>  
      <MDV>210.5</MDV>  
      <MDU>cm</MDU>  
    </MEG>  
    <OMG>  
      <OMD>oil; canvas</OMD>
```

3. Rendered Output

AID	OTY	OTG	OTN	OPD	MDV	MEG	OMG
AGO_95/143	Painting	The Bottle between the Israelites and the Amalekites	Lucas Gordan	unknown	unknown	unknown	unknown
AIC_1910.239	Mummy Goods	Mummy Case of psenkhanamon (preferred)	Egyptian	Third Intermediate Period, Dynasty 22, c. 945 - 715 B.C.	Third Intermediate Period, Dynasty 22, c. 945 - 715 B.C.	Third Intermediate Period, Dynasty 22, c. 945 - 715 B.C.	Third Intermediate Period, Dynasty 22, c. 945 - 715 B.C.
AKAG.1964.116	Painting/Oil	Dynamism of a Glacioso Dog on a Leash	Italian, 1871-1958	1912	1912	1912	1912
ASIA.1979.291	Ceramics	Tes Leaf Jar	Noromura	Edo period, mid-17th century	Edo period, mid-17th century	Edo period, mid-17th century	Edo period, mid-17th century
CCP_94057.038	photograph	Harlem Globetrotter	Mickey Pallas	1949	1949	1949	1949

FIGURE 34

```
#!/usr/local/bin/perl -w
use strict;
```

```
#####
# amico2xml AMICO records to XML conversion
# Author: Bertram Ludaescher <ludaesch@sdsc.edu>
#
# call: amico2xml file
# returns: XML-ified version
#
# 2do: extend escXML, handling of binary data
# $Id: amico2xml,v 1.1 1999/04/06 08:43:40 ludaesch Exp $
#####
```

```
my $output; # handle for current output stream
my @record = (); # current record (= array of fields)
my $tab = 2; # current output tab position

sub ind { # indent according to current tab position
    return " " x $tab
}
```

```
my %long_tag = # hash of defined tags (long names currently
               # not used)
```

```
(
    "ADP" => "ADP__amico_data_processing",
    "AID" => "AID__amico_identifier",
    "ALY" => "ALY__amico_library_year",
    "AVD" => "AVD__amico_validated_date",
    "AVV" => "AVV__validation_dictionary_version",
    "CAD" => "CAD__creator_active_date",
    "CAP" => "CAP__creator_active_place",
    "CBD" => "CBD__creator_birth_date",
    "CBP" => "CBP__creator_birth_place",
    "CBQ" => "CBQ__creator_birth_qualifier",
    "CDD" => "CDD__creator_death_date",
    "CDP" => "CDP__creator_death_place",
    "CDQ" => "CDQ__creator_death_qualifier",
    "CDT" => "CDT__creator_dates_locations_text",
    "CGN" => "CGN__creator_gender",
    "CLG" => "CLG__classification",
    "CLS" => "CLS__classification_scheme",
    "CLT" => "CLT__classification_term",
    "CNO" => "CNO__creator_notes",
    "CRB" => "CRB__creator_biography",
    "CRC" => "CRC__creator_culture_nationality",
```

35A
35B
35C
35D
35E
35F
35G

FIGURE 35A

"CRG" => "CRG_creator",
"CRN" => "CRN_creator_name",
"CRQ" => "CRQ_creator_qualifier",
"CRR" => "CRR_creator_role",
"CRT" => "CRT_creator_name_text",
"CXD" => "CXD_context_description",
"CXG" => "CXG_context",
"CXP" => "CXP_context_related_person",
"CXS" => "CXS_context_related_site_place",
"CXT" => "CXT_context_time_period_dates",
"DCB" => "DCB_documented_cataloged_by",
"DCD" => "DCD_documented_cataloged_date",
"DCG" => "DCG_documentation_cataloguing_history",
"DEL" => "DEL_amico_deletion_flag",
"MCM" => "MCM_measurement_component_measured",
"MDU" => "MDU_measurement_dimension_units",
"MDV" => "MDV_measurement_dimension_value",
"MED" => "MED_measurement_dimension",
"MEG" => "MEG_measurements",
"MEQ" => "MEQ_measurement_qualifier",
"MET" => "MET_measurements_text",
"OCE" => "OCE_creation_date_end",
"OCG" => "OCG_creation_dates",
"OCH" => "OCH_condition_examination_history",
"OCP" => "OCP_creation_place",
"OCQ" => "OCQ_creation_date_qualifier",
"OCR" => "OCR_critical_responses",
"OCS" => "OCS_creation_date_start",
"OCT" => "OCT_creation_date_text",
"OEH" => "OEH_exhibition_or_loan_history",
"OEN" => "OEN_edition",
"OIN" => "OIN_inscriptions_and_or_marks",
"OMD" => "OMD_materials_and_techniques_description",
"OMG" => "OMG_materials_and_techniques",
"OMM" => "OMM_materials_and_techniques_materials_term",
"OMS" => "OMS_materials_and_techniques_support",
"OMT" => "OMT_materials_and_techniques_process_technique_term",
"OOA" => "OOA_owner_accession_number",
"OOC" => "OOC_owner_credit_line",
"OOG" => "OOG_owner",
"OON" => "OON_owner_name",
"OOP" => "OOP_owner_place",
"OPA" => "OPA_physical_orientation_arrangement",
"OPD" => "OPD_physical_description",
"OPO" => "OPO_provenance_prior_owners_text",
"OPP" => "OPP_object_parts_pieces",
"ORG" => "ORG_rights_copyright",
"ORL" => "ORL_copyright_link",
"ORS" => "ORS_copyright_statement",
"OST" => "OST_state",
"OTG" => "OTG_object_title_name",
"OTH" => "OTH_treatment_conservation_history",

FIGURE 35B

"OTN" => "OTN__object_title_name",
"OTT" => "OTT__title_type ",
"OTY" => "OTY__object_type",
"RDD" => "RDD__related_document_description",
"RDG" => "RDG__related_documents",
"RDL" => "RDL__related_document_identifier_link",
"RDR" => "RDR__related_document_relationship_type",
"RID" => "RID__related_image_description",
"RIG" => "RIG__related_images",
"RIL" => "RIL__related_image_identifier_link",
"RIP" => "RIP__related_image_preferred",
"RIR" => "RIR__related_image_relationship_type",
"RMD" => "RMD__related_multimedia_description",
"RMG" => "RMG__related_multimedia",
"RML" => "RML__related_multimedia_identifier_link",
"RMR" => "RMR__related_multimedia_relationship_type",
"RWD" => "RWD__related_works_description",
"RWG" => "RWG__related_works_of_art",
"RWL" => "RWL__related_works_identifier_link",
"RWR" => "RWR__related_works_relationship_type ",
"STD" => "STD__style_period_description",
"STG" => "STG__style_period",
"STT" => "STT__style_period_terms ",
"SUG" => "SUG__subject_matter",
"SUI" => "SUI__subject_matter_iconography",
"SUP" => "SUP__subject_matter_preiconographic_description",
"SUT" => "SUT__subject_matter_index_terms ",
"XAM" => "XAM__amico_mode",
"XCC" => "XCC__dc_creator_corporatename",
"XCM" => "XCM__amico_format_colormetric",
"XCN" => "XCN__dc_creator",
"XCP" => "XCP__dc_creator_personalname",
"XCR" => "XCR__dc_creator_role ",
"XDA" => "XDA__dc_date",
"XDC" => "XDC__dc_contributor_corporatename",
"XDE" => "XDE__dc_description",
"XDL" => "XDL__metadata_deletion_flag",
"XDN" => "XDN__dc_contributor",
"XDP" => "XDP__dc_contributor_personalname",
"XDR" => "XDR__dc_contributor_role ",
"XFC" => "XFC__amico_format_compression",
"XFD" => "XFD__amico_format_dimensions",
"XFE" => "XFE__amico_format_encoding",
"XFF" => "XFF__amico_format_filesize",
"XFO" => "XFO__dc_format",
"XFP" => "XFP__amico_format_colorpalette",
"XID" => "XID__dc_resource_identifier",
"XLY" => "XLY__metadata_library_year",
"XMN" => "XMN__amico_media_note",
"XPR" => "XPR__metadata_data_processing_note",
"XPU" => "XPU__dc_publisher",

FIGURE 35C

```
"XRI" => "XRI__dc_relation_identifier",
"XRS" => "XRS__dc_rights",
"XRT" => "XRT__dc_resourcetype",
"XRY" => "XRY__dc_relation_type",
"XTI" => "XTI__dc_title",
"XVD" => "XVD__amico_metadata_validation_date",
"XVV" => "XVV__amico_data_dictionary_version"
);

sub name {          # long or short tagnames
  return $_[0]      # short
# return $long_tag{$_[0]} # long
}

my %is_group = (); # what tags are groups?

while ((my $tag, my $long) = each %long_tag) {
  $is_group{$tag} = 1 if ($long !~ /_/);
}

my %group_members = # members of each group
(
  "CLG" => "CLS CLT",
  "CRG" => "CRQ CRT CRN CRC CDT CBD CBP CBQ CDD CDP CDQ CAD CAP CGN CRB CRR
CNO",
  "CXG" => "CXD CXP CXS CXT",
  "DCG" => "DCB DCD",
  "MEG" => "MCM MED MDV MDU MEQ",
  "OCG" => "OCT OCS OCE OCQ",
  "OMG" => "OMD OMT OMM OMS",
  "OOG" => "OON OOP OOA OOC",
  "ORG" => "ORS ORL",
  "OTG" => "OTN OTT",
  "RDG" => "RDD RDR RDL",
  "RIG" => "RIP RID RIR RIL",
  "RMG" => "RMD RMR RML",
  "RWG" => "RWD RWR RWL",
  "STG" => "STD STT",
  "SUG" => "SUP SUI SUT",
  "XCN" => "XCP XCC XCR",
  "XDN" => "XDP XDC XDR",
  "XFO" => "XFE XFP XCM XFD XFF XFC",
  "XRE" => "XRY XRI"
);
```

FIGURE 35D

```
my %group = ();          # inverse: returns the group of a member

while ((my $group, my $memstr) = each %group_members) {
    my @members = ($memstr =~ m/[A-Z]{3}/g);
    foreach (@members) {
        $group{$_} = $group;
    }
}

sub escXML {              # escape characters: EXTEND/FIX!
    $_ = $_[0];
    s/</&lt;/g;
    s/&/&amp;/g;
    s/à/a/g;
    s/â/a/g;
    s/ã/a/g;
    s/é/e/g;
    s/è/e/g;
    s/ñ/n/g;
    $_;
}

sub output_fields {       # output all fields from current record
    @record = @_;
    my $field = shift @record;      # get the next field
    if (defined $field) {
        &output_field($field);      # output it (and more if group!)
        &output_fields(@record);    # recurse through the remains
        # of @record
    }
}

sub output_field {        # output the given field PLUS follow-up group
    # members!
    (my $field) = @_;
    if ($field =~ /[A-Z]{3}(.*)/) { # is it a 3 letter tag + data?
        my $tag = $1; my $data = $2;
        if ($long_tag{$tag}) {     # do we know this tag?
            if ($is_group{$tag}) {  # is it a group?
                print &ind, "<", &name($tag), ">\n";
                $tab += 2;
                &output_group($tag); # and output closing tag!
            }
            else {                  # it's a simple recognized tag
                print &ind, "<", &name($tag), ">",
                    &escXML($data),
                    "</", &name($tag), ">\n";
            }
        }
        else {                    # don't know this tag!
            print "<am_ERROR type = 'unrecognized tag'\n";
            print &ind, "<$tag>", &escXML($data), "</$tag>\n";
            print "</am_ERROR>\n";
        }
    }
}
```

FIGURE 35E

```
} else {                                # don't understand that field!
  print "<am_ERROR type = \"unrecognized field\">", $_;
  print "</am_ERROR>\n";
}
}

sub output_group { # output fields WHILE in same group
  (my $grp) = @_;
  my $field = shift @record;           # get the next field
  if (defined $field) {
    if ($field =~ /[A-Z]{3}/) {# should be a tag
      if (defined $group{$1} and $group{$1} eq $grp) {
        # still in the same group??
        &output_field($field);
        &output_group($grp);           # STAY in the same group
      } else {                          # LEAVE group!
        $tab -= 2;
        print &ind, "</", &name($grp), ">\n";    # closing tag for group
        &output_field($field);
      }
    } else {                            # don't understand that field!
      print "<am_ERROR type = \"unrecognized field\">", $_;
      print "</am_ERROR>\n";
    }
  }
  # empty @record => done
}

sub get_record { # read the next record and return first tag
  chomp;
  @record = split /\~/;                # End-Of-Record = "\n"
  my $last = pop(@record);             # get EOR
  if ($last ne "|") {                  # ...and check
    print STDOUT "**** ERROR: unknown delimiter <$last>\n";
  }
  if (@record) {                       # check if non-empty
    return substr($record[0],0,3)      # return the tag name
  } else {
    print STDOUT "**** WARNING: empty record\n";
    return 0
  }
}
```

FIGURE 35F

```
#=====
#  MAIN
#=====

$| = 1;

open(AM_OBJ, ">amico_objects.xml") or die "**** ERROR <@_>\n<$?>\n";
open(AM_MEDIA, ">amico_media.xml") or die "**** ERROR <@_>\n<$?>\n";

print AM_OBJ <<EOF;
<am_objects>
EOF

print AM_MEDIA <<EOF;
<am_media>
EOF

# print AM_OBJ <<EOF;
# <?xml:stylesheet type="text/xsl" href="amico_objects.xsl"?>
# <am_objects>
# EOF

# print AM_MEDIA <<EOF;
# <?xml:stylesheet type="text/xsl" href="amico_media.xsl"?>
# <am_media>
# EOF

while (<>) {
  if (my $tag = &get_record) {          # get next record and tag name
    if ($tag eq "AID") {
      select(AM_OBJ);
      print &ind, "<am_object>\n";
      $tab += 2;
      &output_fields(@record) ;
      $tab -= 2;
      print &ind, "</am_object>\n";
    } elsif ($tag eq "XID") {
      select(AM_MEDIA);
      print &ind, "<am_media_metadata>\n";
      $tab += 2;
      &output_fields(@record) ;
      $tab -= 2;
      print &ind, "</am_media_metadata>\n";
    } else {
      print STDOUT "**** ERROR: unknown tag <$tag> in record: <@record>\n";
    }
  } else {
    print STDOUT "**** ERROR: get_record failed\n";
  }
}

print AM_OBJ "</am_objects>\n";
print AM_MEDIA "</am_media>\n";
```

FIGURE 35G


```
#-----  
# Perl Script to convert XML SLA version  
# into software independent OAV  
# representation, ready to be # loaded  
# into a variety of engines:  
#   - Prolog engine, or  
#   - relational database engine, or  
#   - XML database engine, or  
#   - other  
#  
# SCRIPT devised by Richard Marciano &  
#           Bertram Ludaescher &  
#           Reagan Moore  
# August 20, 2000, copyright RiM + BL + ReM  
#-----
```

```
#!/usr/local/bin/perl  
#use strict;
```

```
#-----  
@boa; %boatype_hash = (); my $bill_count = 0;  
    my $amdt_count = 0; my $con_res_count = 0;  
    my $j_res_count = 0; my $res_count = 0;  
  
@abstract; %a_value = ();  
@congressional_record; %cr_value = ();  
@cosponsors; %cs_value = (); @date_introduced;  
    %di_value = (); @digest; %d_value = ();  
@latest_status; %ls_value = (); @status_actions;  
    %sa_value = (); @official_title; %ot_value = ();  
@sponsor; %s_value = (); @statement_of_purpose;  
    %sop_value = (); @submitted_by; %sb_value = ();  
@submitted_for; %sf_value = (); @filename_senator;  
@filename_period; @prepared_by; @senator;  
@occurrence_section; @occurrence_committee;  
  
@topic_index; %ti_value= ();  
#-----
```

```
my $MORE_SIZE = 20;
```

```
my $bill_index_2 = "";  
my %tempH = ();
```

```
my $line; my $h1; my $h2 = ""; my $h3; my $h4; my $h5; my $h6_1 = ""; my $h6_2  
= "";
```

```
my $prev_h2 = "";  
my $section = 0; my $committee = "";  
my $senNAME = ""; my $state = ""; my $senid;
```

```
my $filename;  
my $line_number;
```

36A	36N
36B	36O
36C	36P
36D	36Q
36E	36R
36F	36S
36G	36T
36H	36U
36I	36V
36J	36W
36K	36X
36L	36Y
36M	36Z

FIGURE 36A

```
my @allfile;

opendir THISDIR , "XMLDATA" or die "can't find DIRECTORY: $!";
@allfile = grep /_LAR/, readdir THISDIR;
closedir THISDIR;
open( LOG, ">logfile" ) || die "*ERROR: can't open logfile\n" ;

#=====
=====

foreach my $sen (@allfile) {

    #my $sen = "D_$ARGV[1]_LAR$ARGV[0]_106.xml";
    #my $sen = "D_1CP_LAR_S106_106.xml";
    #my $sen = "D_1CP_LAR_S216_106.xml";
    #my $sen = "D_1_LARI_S272_106.xml";

    $sen =~ m/./\.\.\.\_S(\d+)\.\./;
    $senid = $1;
    $senid = $1;
    $senNAME = "";

    $filename = $sen;
    $line_number = 0;

    open( SEN106, "XMLDATA/$sen" ) || die "*ERROR: can't open $sen\n" ;
    #open( SEN106, "$sen" ) || die "*ERROR: can't open $sen\n" ;

    &process_header( $sen );

    N1:while( $line = <SEN106> ) {
        $line_number++;
    N2;;
        # DETECT SECTION headers
        if ( $line =~ m/hidden="on">(.)<\/string>/ ) {
            $h1 = $1;
        }
        # <p align="left" bold="on"><string bold="on">SECTION I. SPONSORED
        MEASURES<\/string><\/p>
        if ( $h1 =~ m/SECTION I\./ ) {
            $section = 1; $h6_1 = ""; $h6_2 = "";

            my $ov = $senid . "_" . "$line_number";

            my $len = $#occurrence_section;
            $occurrence_section[ $len + 1 ] = [ ($senid, $line_number,
            $section, $h1) ];
        }
        elsif ( $h1 =~ m/SECTION II\./ ) {
            $section = 2; $h6_1 = ""; $h6_2 = "";

            my $ov = $senid . "_" . "$line_number";
```

FIGURE 36B

```
elseif ( $h1 == m/SECTION IV\./ ) {
    $section = 4;

    my $ov = $senid . "_" . "$line_number";

    my $len = $#occurrence_section;
    $occurrence_section[ $len + 1 ] = [ ( $senid, $line_number,
$section, $h1 ) ];
}
elseif ( $h1 == m/SECTION V\./ ) {
    $section = 5; $h6_1 = ""; $h6_2 = "";

    my $ov = $senid . "_" . "$line_number";

    my $len = $#occurrence_section;
    $occurrence_section[ $len + 1 ] = [ ( $senid, $line_number,
$section, $h1 ) ];
}
elseif ( $h1 == m/SECTION VI\./ ) {
    $section = 6; $h6_1 = ""; $h6_2 = "";

    my $ov = $senid . "_" . "$line_number";

    my $len = $#occurrence_section;
    $occurrence_section[ $len + 1 ] = [ ( $senid, $line_number,
$section, $h1 ) ];
}
elseif ( $h1 == m/SECTION VII\./ ) {
    $section = 7; $h6_1 = ""; $h6_2 = "";

    my $ov = $senid . "_" . "$line_number";

    my $len = $#occurrence_section;
    $occurrence_section[ $len + 1 ] = [ ( $senid, $line_number,
$section, $h1 ) ];

    &process_index;
}
else {
    print LOG "!!! error:COULD NOT RECOGNIZE SECTION NUMBER !!!\n";
}
}

# DETECT **** BILL NUMBERS
elseif ( $line == m/>\*\*\*\* (.+)</p>/ ) {
    $h2 = $1;
    $h2 == s/\s*//g;

    if ( $prev_h2 ne "" ) {
#       S.123          1 dot
#       S.Amdt.123    2 dots
    }
```

FIGURE 36C

```
        $boatype_hash{ bill }{ $bill }++;
    }
}
else {
    if( $list[1] eq "Amdt" ) {
        $amdt_count++;

        my $bill;
        foreach $bill ( sort keys %{ $tempH{ $prev_h2 } } ) {
            if ( $boatype_hash{ amdt }{ $bill } eq "" ) {
                $boatype_hash{ amdt }{ $bill } = 0;
            }
            $boatype_hash{ amdt }{ $bill }++;
        }
    }
    elsif( $list[1] eq "Con" ) {
        $con_res_count++;

        foreach my $bill ( sort keys %{ $tempH{ $prev_h2 } } ) {
            if ( $boatype_hash{ con_res }{ $bill } eq "" ) {
                $boatype_hash{ con_res }{ $bill } = 0;
            }
            $boatype_hash{ con_res }{ $bill }++;
        }
    }
    elsif( $list[1] eq "J" ) {
        $j_res_count++;

        foreach my $bill ( sort keys %{ $tempH{ $prev_h2 } } ) {
            if ( $boatype_hash{ j_res }{ $bill } eq "" ) {
                $boatype_hash{ j_res }{ $bill } = 0;
            }
            $boatype_hash{ j_res }{ $bill }++;
        }
    }
    elsif( $list[1] eq "Res" ) {
        $res_count++;

        foreach my $bill ( sort keys %{ $tempH{ $prev_h2 } } ) {
            if ( $boatype_hash{ res }{ $bill } eq "" ) {
                $boatype_hash{ res }{ $bill } = 0;
            }
            $boatype_hash{ res }{ $bill }++;
        }
    }
    else {
        print "$prev_h2\tERROR in recording boatype_hash\n";
    }
}
$list = "";
$prev_h2 = $h2;
```

FIGURE 36D

```
# SKIP OVER header SECTIONS
#<header>
#<p align="center" bold="on" italic="off"><field><fldinst> PAGE
</fldinst><fldrslt><string charstyname="" bold="on" italic="off">2</string>
# </fldrslt></field></p>
#<p align="right" bold="on" italic="off"><string bold="on" italic="off">Paul
S. Sarbanes</string></p>
#<p align="left" bold="on" italic="off"><string bold="on" italic="off">SECTION
IV. COSPONSORED MEASURES</string></p>
#<p align="left" bold="on" italic="off"><string bold="on"
italic="off">&tab;&tab; ORGANIZED BY COMMITTEE REFERRAL</string></p>
#<p align="left" bold="on" italic="off"><string bold="on"
italic="off">&tab;&tab; SENATE: AGRICULTURE</string></p>
#<p align="left" bold="off" italic="off"></p>
#</header>

elseif ( $line =~ m/<header/ ) {
    my $i = 0;
    while( $line = <SEN106> ) {
        $line_number++;
        if ( $line =~ m/<p align=.\+>(.\+)</p>/ ) {
            $h4 = $1;
            $i++;
            if ( $i == 3 && ( $section == 2 || $section == 3 || $section
== 4 ) ) {
                $h4 =~ m/SECTION (.+)\. .+</string>/;
                $h5 = $1;
                if ( $h5 eq "III" ) {
                    $committee = 3;
                }
                elsif ( $h5 eq "IV" ) {
                    $committee = 4;
                }
                else {
                    $committee = "";
                }
            }
            elsif ( $i == 5 && ( $committee == 3 || $committee == 4 ) ) {
                $h4 =~ m/SECTION (.+)\. .+</string>/;
                $h4 =~ m/&tab;&tab;\s+(.)</string>/;
                $h6_1 = "COMMITTEE";
                $h6_2 = "$1";

                my $ov = $senid . "_" . "$line_number";
                $occurrence_value{ $ov } = "";

                my $len = $#occurrence_committee;
                $occurrence_committee[ $len + 1 ] = [ ( $senid,
$line_number, $committee, $h6_2) ];
            }
        }
    }
}
```

FIGURE 36E

```
#-----
my $ov = $senid . "_" . "$line_number";

$di_value{ $val } = "";

my $len = $#date_introduced;
$date_introduced[ $len + 1 ] = [ ($senid, $line_number, $val) ];
#-----

if ( $section == 1 || $section == 3 ) {
    $tempH{$h2}{SPONSOR} = "$senid";
#-----

    my $ov = $senid . "_" . "-1";

    my $s = $senid;
    $s =~ s/_/_/g;
    $s_value{ $s } = "";

    my $len = $#sponsor;
    $sponsor[ $len + 1 ] = [ ($senid, "-1", $s) ];
#-----
}

elseif ( $section == 2 || $section == 4 ) {
    $line = <SEN106>;
    $line_number++;
#    <p bold="off" italic="off">SPONSOR: Daschle</p>
    if ( $line =~ m/<p .+>(.)</p>/ ) {
        my $mysponsor = $1;
        my $value = $2;
        $tempH{$h2}{SPONSOR} = $value;
#-----

        my $ov = $senid . "_" . "$line_number";

        my $s = $value;
        $s =~ s/_/_/g;
        $s_value{ $s } = "";

        my $len = $#sponsor;
        $sponsor[ $len + 1 ] = [ ($senid, $line_number, $s) ];
#-----
    }
}

elseif ( $section == 5 ) {
#    <p>SUBMITTED FOR: S. 4&tab;CONGRESSIONAL RECORD: S1830</p>
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p>(.)</p>/ ) {
        my $submit = $1;
```

FIGURE 36F

```
my $ov = $senid . "_" . "-1";

my $s = $senid;
$s =~ s/_/_/g;
$s_value{ $s } = "";

my $len = $#sponsor;
$sponsor[ $len + 1 ] = [ ( $senid, "-1", $s ) ];
#-----

$line = <SEN106>;
$line_number++;
if ( $line =~ m/<p>(.)+: (.+)<\/p>/ ) {
    my $submitted_by = $1;
    my $value = $2;

    $tempH{$h2}{SUBMITTED_BY} = $value;
#-----

    my $ov = $senid . "_" . "$line_number";

    my $sb = $value;
    $sb =~ s/_/_/g;
    $sb_value{ $sb } = "";

    my $len = $#submitted_by;
    $submitted_by[ $len + 1 ] = [ ( $senid, $line_number, $sb )
];
#-----
    }
    elsif ( $line =~ m/<p align=.*>(.)<\/p>/ ) {
        $h3 = $1;
        goto N4;
    }
}

elsif ( $section == 6 ) {
#    <p>SUBMITTED FOR: S.      4&tab;CONGRESSIONAL RECORD: S1830</p>
#    <p>SPONSOR: Murray</p>
#    <p>SUBMITTED BY: Bingaman</p>
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p>(.)<\/p>/ ) {
        my $submit = $1;
        my ( $part1, $part2 ) = split(/&tab;/, $submit);
        my ( $part1_1, $part1_2 ) = split(/: /, $part1);
        my ( $part2_1, $part2_2 ) = split(/: /, $part2);

        $part1_2 =~ s/\\s*//g;

        $tempH{$h2}{SUBMITTED_FOR} = $part1_2;
#-----
```

FIGURE 36G

```
#-----
$tempH{$h2}{CONGRESSIONAL_RECORD} = $part2_2;
#-----

$ov = $senid . "_" . "$line_number";

my $cr = $part2_2;
$cr =~ s/ /_/g;
$cr_value{ $cr } = "";

$len = $#congressional_record;
##      $congressional_record[ $len + 1 ] = [ ($senid,
$line_number, $cr, $h2) ];
      $congressional_record[ $len + 1 ] = [ ($senid,
$line_number, $cr) ];
#-----
    }
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p>(.)+: (.)</p>/ ) {
        my $mysponsor = $1;
        my $value = $2;

        $tempH{$h2}{SPONSOR} = $value;
#-----

        my $ov = $senid . "_" . "$line_number";

        my $s = $value;
        $s =~ s/ /_/g;
        $s_value{ $s } = "";

        my $len = $#sponsor;
        $sponsor[ $len + 1 ] = [ ($senid, $line_number, $s) ];
#-----
    }
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p>(.)+: (.)</p>/ ) {
        my $submitted_by = $1;
        my $value = $2;

        $tempH{$h2}{SUBMITTED_BY} = $value;
#-----

        my $ov = $senid . "_" . "$line_number";

        my $sb = $value;
        $sb =~ s/ /_/g;
        $sb_value{ $sb } = "";

        my $len = $#submitted_by;
```

FIGURE 36H


```
N4:if ( $h3 eq "COSPONSORS" ) {
#       <p bold="off" italic="off">Edwards; Bayh; Kerry; Bingaman (A-
11/05/1999):</p>
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p .+>(.)</p>/ ) {
        my $mycosponsors = $1;

        if ( ($mycosponsors ne "") && ($mycosponsors ne "NONE") ) {
            $stempH{$h2}{COSPONSORS} = $mycosponsors;
#-----

            my $ov = $senid . "_" . "$line_number";

            my $cs = $mycosponsors;
            $cs =~ s/ /_/g;
            $cs_value{ $cs } = "";

            my $len = $#cosponsors;
            $cosponsors[ $len + 1 ] = [ ($senid, $line_number, $cs) ];
#-----
        }
        else {
            $stempH{$h2}{COSPONSORS} = "NONE";
#-----

            my $ov = $senid . "_" . "$line_number";

            my $cs = $mycosponsors;
            $cs =~ s/ /_/g;
            $cs_value{ $cs } = "";

            my $len = $#cosponsors;
            $cosponsors[ $len + 1 ] = [ ($senid, $line_number, $cs) ];
#-----
        }
    }
    else {
        print LOG "!!! error:$senid:$h2:$h3  COSPONSORS tag !!!!\n";
    }
}

elseif ( $h3 eq "OFFICIAL TITLE" ) {
#       <p bold="off" italic="off">.....</p>
    $line = <SEN106>;
    $line_number++;
    if ( $line =~ m/<p .+>(.)</p>/ ) {
        my $title = $1;
        $stempH{$h2}{OFFICIAL_TITLE} = $title;
#-----

        my $ov = $senid . "_" . "$line_number";
```

FIGURE 36I

```

        elsif ( $h3 eq "LATEST STATUS" || $h3 eq "STATUS ACTIONS" ) {
#           <p bold="off"><string bold="on">Oct 25, 1999&tab;Became Public
Law No: 106-80.</string></p>
#           <p><string>May 27, 1999&tab;Proposed amendment S.Amdt. 387
withdrawn in Senate.</string></p>
#           <p><string>May 27, 1999&tab;Proposed by Senator Levin for Senator
Sarbanes.</string></p>
#           <p align="center" italic="off">ABSTRACT</p>
        my $cumulative_content = "";
        my $i = 0;
        my $save_line_number;
        while ( $line = <SEN106> ) {
            $line_number++;
            if ( $i == 0 ) { $save_line_number = $line_number; }
            $i++;
            if ( $line =~ m/<p.*><string.*>(.)</string></p>/ ) {
                my $content = $1;
                $cumulative_content .= "$content CCCRRR "; # replace \n
with " CCCRRR "
            }
            else {
                if ( $h3 eq "LATEST STATUS" ) {
                    $tempH{$h2}{LATEST_STATUS} = $cumulative_content;
                }
                elsif ( $h3 eq "STATUS ACTIONS" ) {
                    $tempH{$h2}{STATUS_ACTIONS} = $cumulative_content;
                }
            }
#-----

        my $ov = $senid . "_" . "$line_number";

        if ( $h3 eq "LATEST STATUS" ) {
            my $status = $cumulative_content;
            $status =~ s/ /_/g;
            $ls_value{ $status } = "";

            my $len = $#latest_status;
            $latest_status[ $len + 1 ] = [ ( $senid, $line_number,
$status) ];
        }
        elsif ( $h3 eq "STATUS ACTIONS" ) {
            my $status = $cumulative_content;
            $status =~ s/ /_/g;
            $sa_value{ $status } = "";

            my $len = $#status_actions;
            $status_actions[ $len + 1 ] = [ ( $senid, $line_number,
$status) ];
        }
#-----
        goto N2;
    }

```

FIGURE 36J

```
    }  
  }  
  
  elseif ( $h3 eq "ABSTRACT" ) {  
#    <p italic="off">NONE</p>  
    $line = <SEN106>;  
    $line_number++;  
    if ( $line =~ m/<p.*>(.)</p>/ ) {  
      my $abstract = $1;  
      $tempH{$h2}{ABSTRACT} = $abstract;  
#-----  
  
      my $ov = $senid . "_" . "$line_number";  
  
      my $a = $abstract;  
      $a =~ s/_/_/g;  
      $a_value{ $a } = "";  
  
      my $len = $#abstract;  
      $abstract[ $len + 1 ] = [ ($senid, $line_number, $a) ];  
#-----  
    }  
    else {  
      print LOG "!!! error:$senid:$h2:$h3  ABSTRACT tag !!!!\n";  
    }  
  }  
  
  elseif ( $h3 eq "STATEMENT OF PURPOSE" ) {  
#    <p align="center" italic="off">STATEMENT OF PURPOSE</p>  
  
#    <p italic="off">...</p>  
#      OR  
#    <p align="center" italic="off">ABSTRACT</p>  
#      OR  
#    </section>  
  
    $line = <SEN106>;  
    $line_number++;  
#-----  
  
    my $ov = $senid . "_" . "$line_number";  
#-----  
    if ( $line =~ m/<p italic=.+>(.)</p>/ ) {  
      my $stmt = $1;  
      if ( $stmt eq "" ) {  
        $tempH{$h2}{STATEMENT_OF_PURPOSE} = $stmt;  
      }  
      else {  
        $tempH{$h2}{STATEMENT_OF_PURPOSE} = $stmt;  
      }  
#-----  
      my $sop = $stmt;  
      $sop =~ s/_/_/g;
```

FIGURE 36K

```

    my $sop = "";
    $sop_value{ $sop } = "";

    my $len = $#statement_of_purpose;
    $statement_of_purpose[ $len + 1 ] = [ ($senid, $line_number,
$sop) ];
#-----
    goto N2;
  }
  else {
    print LOG "!!! error:$senid:$h2:$h3 STATEMENT OF PURPOSE tag
!!!!\n";
  }

}

elseif ( $h3 eq "DIGEST" ) {
#
  <p italic="off">NONE</p>
  $line = <SEN106>;
  $line_number++;
  if ( $line =~ m/<p .+>(.)</p>/ ) {
    my $mydigest = $1;
    $tempH{$h2}{DIGEST} = $mydigest;
#-----

    my $ov = $senid . "_" . "$line_number";

    my $d = $mydigest;
    $d =~ s/_/_/g;
    $d_value{ $d } = "";

    my $len = $#digest;
    $digest[ $len + 1 ] = [ ($senid, $line_number, $d) ];
#-----
  }
  else {
    print LOG "!!! error:$senid:$h2:$h3 DIGEST tag !!!!\n";
  }

}

else {
  print LOG "!!! error:$senid:$h2:$h3 UNKNOWN tag !!!!\n";
}
}
} # END WHILE

THEEND;;
$prev_h2 = $h2;

} # comment out foreach loop

my $buff = "";

```

FIGURE 36L

PROCS:

```
if( $inputstr eq "q" )      { goto MYEND; }
elseif( $inputstr eq "b" )  { &print_table( "boa" ); }
elseif( $inputstr eq "a" )  { &print_table( "abstract" ); }
elseif( $inputstr eq "ha" ) { &print_hash ( "a_value" ); }
elseif( $inputstr eq "cr" ) { &print_table( "congressional_record" ); }
elseif( $inputstr eq "hcr" ) { &print_hash ( "cr_value" ); }
elseif( $inputstr eq "cs" ) { &print_table( "cosponsors" ); }
elseif( $inputstr eq "hcs" ) { &print_hash ( "cs_value" ); }
elseif( $inputstr eq "di" ) { &print_table( "date_introduced" ); }
elseif( $inputstr eq "hdi" ) { &print_hash ( "di_value" ); }
elseif( $inputstr eq "d" )  { &print_table( "digest" ); }
elseif( $inputstr eq "hd" ) { &print_hash ( "d_value" ); }
elseif( $inputstr eq "ls" ) { &print_table( "latest_status" ); }
elseif( $inputstr eq "hls" ) { &print_hash ( "ls_value" ); }
elseif( $inputstr eq "sa" ) { &print_table( "status_actions" ); }
elseif( $inputstr eq "hsa" ) { &print_hash ( "sa_value" ); }
elseif( $inputstr eq "ot" ) { &print_table( "official_title" ); }
elseif( $inputstr eq "hot" ) { &print_hash ( "ot_value" ); }
elseif( $inputstr eq "s" )  { &print_table( "sponsor" ); }
elseif( $inputstr eq "hs" ) { &print_hash ( "s_value" ); }
elseif( $inputstr eq "sop" ) { &print_table( "statement_of_purpose" ); }
elseif( $inputstr eq "hsop" ) { &print_hash ( "sop_value" ); }
elseif( $inputstr eq "sb" ) { &print_table( "submitted_by" ); }
elseif( $inputstr eq "hsb" ) { &print_hash ( "sb_value" ); }
elseif( $inputstr eq "sf" ) { &print_table( "submitted_for" ); }
elseif( $inputstr eq "hsf" ) { &print_hash ( "sf_value" ); }
elseif( $inputstr eq "ti" ) { &print_table( "topic_index" ); }
elseif( $inputstr eq "hti" ) { &print_hash ( "ti_value" ); }

elseif( $inputstr eq "1" )  { &print_table( "filename_senator" ); }
elseif( $inputstr eq "2" )  { &print_table( "senator" ); }
elseif( $inputstr eq "3" )  { &print_table( "filename_period" ); }
elseif( $inputstr eq "4" )  { &print_table( "prepared_by" ); }
elseif( $inputstr eq "5" )  { &print_table( "occurrence_section" ); }
elseif( $inputstr eq "6" )  { &print_table( "occurrence_committee" ); }
elseif( $inputstr eq "pp" )  { &pretty_print_tables( "106" ); }
else { print "\t\t**** WRONG OPTION ****\n"; }

&print_prompt;
}

MYEND;;

close LOG;
exit;

#=====
===
```

FIGURE 36M

```
print "\t\"d\". digest ..... \"hd\". d_value\n";
print "\t\"ls\". latest_status ..... \"hls\". ls_value\n";
print "\t\"sa\". status_actions ..... \"hsa\". sa_value\n";
print "\t\"ot\". official_title ..... \"hot\". ot_value\n";
print "\t\"s\". sponsor ..... \"hs\". s_value\n";
print "\t\"sop\". statement_of_purpose .... \"hsop\". sop_value\n";
print "\t\"sb\". submitted_by ..... \"hsb\". sb_value\n";
print "\t\"sf\". submitted_for ..... \"hsf\". sf_value\n";
print "\t\"ti\". topic_index ..... \"hti\". ti_value\n";
print "\t\n";
print "\t\"1\". filename_senator --- \"2\". senator\n";
print "\t\"3\". filename_period --- \"4\". prepared_by\n";
print "\t\"5\". occurrence_section --- \"6\". occurrence_committee\n";
print "\t\n";
print "\t\"pp\". pretty print (Prolog)---\n";
print " *****\n";
}

sub pretty_print_tables {
    my $sid = $_[0];

    my $DIR = "Prolog/sen_$senid";
    mkdir $DIR, 0755;

    open( PP, ">$DIR/boa.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "boa" );
    close PP;

    open( PP, ">$DIR/abstract.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "abstract" );
    close PP;

    open( PP, ">$DIR/congressional_record.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "congressional_record" );
    close PP;

    open( PP, ">$DIR/cosponsors.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "cosponsors" );
    close PP;

    open( PP, ">$DIR/date_introduced.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "date_introduced" );
    close PP;

    open( PP, ">$DIR/digest.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "digest" );
    close PP;

    open( PP, ">$DIR/latest_status.P" ) || die "*ERROR: can't open\n" ;
    &pretty_print( "latest_status" );
    close PP;

    open( PP, ">$DIR/status_actions.P" ) || die "*ERROR: can't open\n" ;
```

FIGURE 36N

```
open( PP, ">$DIR/statement_of_purpose.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "statement_of_purpose" );
close PP;

open( PP, ">$DIR/submitted_by.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "submitted_by" );
close PP;

open( PP, ">$DIR/submitted_for.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "submitted_for" );
close PP;

open( PP, ">$DIR/topic_index.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "topic_index" );
close PP;

open( PP, ">$DIR/filename_senator.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "filename_senator" );
close PP;

open( PP, ">$DIR/filename_period.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "filename_period" );
close PP;

open( PP, ">$DIR/senator.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "senator" );
close PP;

open( PP, ">$DIR/prepared_by.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "prepared_by" );
close PP;

open( PP, ">$DIR/occurrence_section.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "occurrence_section" );
close PP;

open( PP, ">$DIR/occurrence_committee.P" ) || die "**ERROR: can't open\n" ;
&pretty_print( "occurrence_committee" );
close PP;
}

sub pretty_print {
    my $arg_table = $_[0];

    # digest('quoted strings', ..., .., ..).

    my $buff = "";
    my @arr = "";
    my $inputstr = "";

    no strict;
```

FIGURE 360

```
    else {
        print PP "\"$aref->[$j]\"",
    }
}
$aref->[$n] =~ s/_/ /g;

if( $arg_table eq "latest_status" || $arg_table eq "status_actions" )
{
    $aref->[$n] =~ s/ CCCRRR /\n/g;
    my @list = split(/\n/, $aref->[$n]);
    my $len = $#list;
    my $newstr = "[";
    foreach my $i ( 0 .. $len ) {
        my ($ls_date, $ls_mesg) = split(/\t/, $list[$i]);
        $newstr .= "d(\"$ls_date\", ";
        $newstr .= "\"$ls_mesg\")";
        if( $len > 0 && $i < $len ) {
            $newstr .= ", ";
        }
    }
    $newstr .= "]";
    $aref->[$n] = $newstr;
    print PP "$aref->[$n]";
    print PP "\n";
}

elseif( $arg_table eq "cosponsors" ) {
#Dodd; Bryan; Leahy; Edwards; Hollings; Breaux (A-02/08/2000):

    if ( $aref->[$n] =~ m/./+:/ ) {
        chop $aref->[$n];
    }
    my @colist = split(/:/, $aref->[$n]);
    my $newstr = "[";
    foreach my $item (@colist) {
        my $items = "";
        $item =~ m/\\s*(.+)/ && ($items = $1);
        my $co_name = "";
        my $co_amend = "";
        # Mikulski (A-11/08/1999)
        if ( $items =~ m/(.+)\((.+)\)/ ) {
            $co_name = $1;
            $co_amend = $2;
            $newstr .= "d(\"$co_name\", \"$co_amend\"), ";
        }
        else {
            my $cosponsor_val = $items;
            $newstr .= "\"$cosponsor_val\", ";
        }
    }
    chop $newstr;
    chop $newstr;
    $newstr .= "]";
}
```

FIGURE 36P


```
#=====
====
sub print_bills {
    my $bill;
    my $field;
    foreach $bill ( sort keys %HoH ) {
        print "<bill name=\""$bill\"">\n";
        my $flag_NONE = "false";
        foreach $field ( sort keys %{ $HoH{$bill} } ) {
            if( $field eq "DATE INTRODUCED" ) {
                print "
<date_introduced>$HoH{$bill}{$field}</date_introduced>\n";
            }

#-----
            elsif( $field eq "SPONSOR" ) {
                my $sponsor_val = $HoH{$bill}{$field};
                my $val = "";
                my $print_field;
                $sponsor_val =~ m/^(d+)/ && ($val = $1);
                if ( $val ne "" ) { # then it's a number
                    my $key = $senNUMHash{ $val };
                    $print_field = $keypeopleHash{ $key }{ nameURI }; # use of
uninitialized value!!!
                    print "    <sponsor>$print_field</sponsor>\n";
                }
                else {
                    $sponsor_val =~ s/ //g;
                    $sponsor_val = lc $sponsor_val;
                    if ( exists( $keypeopleHash{ $sponsor_val } ) ) {
                        $print_field = $keypeopleHash{ $sponsor_val }{ nameURI };
                    };
                    print "    <sponsor>$print_field</sponsor>\n";
                }
                else {
                    print LOG "!!! In print_bills: in SPONSOR section:
keypeopleHash{ $sponsor_val } DOES NOT EXIST!\n";
                    print "    <sponsor>$HoH{$bill}{$field}</sponsor>\n";
                }
            }
        }
    }

#-----
    elsif( $field eq "COSPONSORS" ) {
        my $cosponsors = $HoH{$bill}{$field};
        if ( $cosponsors =~ m/./+:/ ) {
            chop $cosponsors;
        } #=== COMMENT if you want COSPONSOR=NONE to disappear
        print "    <cosponsors>\n";
    }
}
```

FIGURE 36Q

```

if ( $items =~ m/(.+) \((.+)\)/ ) {
    $co_name = $1;
    $co_amend = $2;
    my $cosponsor_val = $co_name;
    my $val = "";
    my $print_field;
    $cosponsor_val =~ s/ //g;
    $cosponsor_val = lc $cosponsor_val;
    if ( exists( $keypeopleHash{ $cosponsor_val } ) )
    {
        $print_field = $keypeopleHash{ $cosponsor_val }
    }
    { nameURI };
    print "                                <co_name a-
date=\"$co_amend\">$print_field</co_name>\n";
    }
    else {
        print LOG "!!! In print_bills: in COSPONSORS
section: keypeopleHash{ $cosponsor_val } DOES NOT EXIST!\n";
        print "                                <co_name a-
date=\"$co_amend\">$co_name</co_name>\n";
    }
}
else {
    my $cosponsor_val = $items;
    my $val = "";
    my $print_field;
    $cosponsor_val =~ s/ //g;
    $cosponsor_val = lc $cosponsor_val;
    if ( exists( $keypeopleHash{ $cosponsor_val } ) )
    {
        $print_field = $keypeopleHash{ $cosponsor_val }
    }
    { nameURI };
    print "
<co_name>$print_field</co_name>\n"
    }
    else {
        print LOG "!!! In print_bills: in COSPONSORS
section: keypeopleHash{ $cosponsor_val } DOES NOT EXIST!\n";
        print "
<co_name>$items</co_name>\n"
    }
}
print "                                </cosponsor>\n";
}
print "                                </cosponsors>\n";
# ) === UNCOMMENT if you want COSPONSOR=NONE to disappear
}
elseif( $field eq "OFFICIAL_TITLE" ) {
    print "
<official_title>$HoH{$bill}{$field}</official_title>\n";
}

elseif( $field eq "LATEST_STATUS" ) {

```

FIGURE 36R

```

elseif( $field eq "ABSTRACT" ) {
  print "    <abstract>$HoH{$bill}{$field}</abstract>\n";
}
elseif( $field eq "COMMITTEE" ) {
  my $len = ${ $HoH{$bill}{COMMITTEE} };
  print "    <committees>\n";
  foreach my $i ( 0 .. $len ) {
    print "
<committee>$HoH{$bill}{$field}[$i]</committee>\n";
  }
  print "    </committees>\n";
}
elseif( $field eq "SUBMITTED_FOR" ) {
  print "
<submitted_for>$HoH{$bill}{$field}</submitted_for>\n";
}
elseif( $field eq "CONGRESSIONAL_RECORD" ) {
  print "
<congressional_record>$HoH{$bill}{$field}</congressional_record>\n";
}

#-----
elseif( $field eq "SUBMITTED_BY" ) {
  my $submitted_by_val = $HoH{$bill}{$field};
  my $val = "";
  my $print_field;
  $submitted_by_val =~ s/ //g;
  $submitted_by_val = lc $submitted_by_val;
  if ( exists( $keypeopleHash{ $submitted_by_val } ) ) {
    $print_field = $keypeopleHash{ $submitted_by_val };
nameURI };
    print "
<submitted_by>$print_field</submitted_by>\n";
  }
  else {
    print LOG "!!! In print_bills: in SUBMITTED_BY
section: keypeopleHash{ $submitted_by_val } DOES NOT EXIST!\n";
    print "
<submitted_by>$HoH{$bill}{$field}</submitted_by>\n";
  }
}

elseif( $field eq "STATEMENT_OF_PURPOSE" ) {
  print "
<statement_of_purpose>$HoH{$bill}{$field}</statement_of_purpose>\n";
}
elseif( $field eq "DIGEST" ) {
  print "    <digest>$HoH{$bill}{$field}</digest>\n";
}
else {
  print LOG "!!! WRONG TAG:$field !!! in sub: print_bills\n";
}
}

```

FIGURE 36S

```
no strict;

my $len = ${$arg_table} + 1;
print "$arg_table: COUNT=$len\n";
for my $i ( 0 .. ${$arg_table} ) {

    if ( !($i % $MORE_SIZE) && !($i == 0) ) {
        my $percent = ( ($i+1) / $len ) * 100;
        print "--More--";
        printf( "(%1d)", $percent );
        print "\% -- q: to quit\n";
        read(STDIN, $buff, 1);

        for ( my $i = 0; ; read(STDIN, $buff, 1) ) {
            if ( $i == 0 ) { @arr=""; }
            $arr[$i++] = $buff;
            if ( $buff eq "\n" ) {
                $inputstr = join '', @arr;
                chop $inputstr;
                goto NEXT;
            }
            $buff = "";
        }
    }

NEXT:
    if( $inputstr eq "q" ) { goto END_PRINT_TABLE; }

    my $aref = ${$arg_table}[$i];
    my $n = @$aref - 1;
    printf( "\t%5d:", $i );
    for my $j ( 0 .. $n ) {
        print "\t$aref->[$j]";
    }
    print "\n";
}

END_PRINT_TABLE;;
}

sub print_hash {
    my $arg_hash = $_[0];

    no strict;

    my $buff = "";
    my @arr = "";
    my $inputstr = "";

    my $len = scalar keys %{$arg_hash};
    print "$arg_hash Hash: COUNT=$len\n";
    my $i = 0;
    foreach my $key( sort keys %{$arg_hash} ) {

        if ( !($i % $MORE_SIZE) && !($i == 0) ) {
```

FIGURE 36T

```
for ( my $i = 0; ; read(STDIN, $buff, 1) ) {
    if ( $i == 0 ) { @arr=""; }
    $arr[$i++] = $buff;
    if ( $buff eq "\n" ) {
        $inputstr = join '', @arr;
        chop $inputstr;
        goto NEXT2;
    }
    $buff = "";
}
}
NEXT2:
    if( $inputstr eq "q" ) { goto END_PRINT_HASH; }

    $i++;
    print "\t*$key*\n";
}
END_PRINT_HASH:;
}

=====
====
#<section>
#<p fontname="Courier New" fontsize="20"></p>
#<p align="center" fontname="Courier New" fontsize="28" bold="on">UNITED
STATES SENATE</p>
#<p align="center" fontname="Courier New" fontsize="28" bold="on"></p>
#<p align="center" fontname="Courier New" fontsize="28" bold="on"></p>
#<p align="center" fontname="Courier New" fontsize="28" bold="on"></p>
#<p align="center" fontname="Courier New" fontsize="28" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="48"
bold="on">_____/p>
#<p align="left" fontname="Courier New" fontsize="48" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="48" bold="on">LEGISLATIVE
ACTIVITIES</p>
#<p align="left" fontname="Courier New" fontsize="48"
bold="on">_____/p>
#<p align="left" fontname="Courier New" fontsize="48" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="36" bold="on">THE
HONORABLE</p>
#<p align="left" fontname="Courier New" fontsize="36" bold="on">PAUL S.
SARBANES</p>
#<p align="left" fontname="Courier New" fontsize="36" bold="on">OF
MARYLAND</p>
#<p align="left" fontname="Courier New" fontsize="36" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="28" bold="on">FOR THE
PERIOD</p>
#<p align="left" fontname="Courier New" fontsize="28" bold="on">JANUARY 06,
1999 TO MARCH 31, 2000</p>
#<p align="left" fontname="Courier New" fontsize="28" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="48"
bold="on">_____/p>
#<p fontname="Courier New" fontsize="20" bold="on"></p>
```

FIGURE 36U

PERSISTENT ARCHIVES
Inventors: Reagan W. Moore, et al.
Howrey Docket No. 02737.0004.NPUS01
94/118

```
#<p fontname="Courier New" fontsize="20" bold="on"></p>
#<p fontname="Courier New" fontsize="20" bold="on"></p>
#<p fontname="Courier New" fontsize="20" bold="on"></p>
#<p fontname="Courier New" fontsize="20" bold="on"></p>
#<p fontname="Courier New" fontsize="20" bold="on"></p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on">Prepared
by:</p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on">Senate
Computer Center</p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on">Office of the
Sergeant at Arms</p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on">and</p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on">Committee on
Rules and Administration</p>
#</section>

sub process_header {
  while( $line = <SEN106> ) {
    $line_number++;
    if ( $line =~ m/<p align=.+>(.)</p>/ ) {
      $h4 = $1;
      if ( $line =~ m/THE HONORABLE/ ) {

        $line = <SEN106>;
        $line_number++;
        $line =~ m/<p align=.+>(.)</p>/;
        $senNAME= $1;
        my $first_line = $line_number;

        $line = <SEN106>;
        $line_number++;
        $line =~ m/OFF (.*)</p>/;
        $state = $1;

        my @senlist = split(/ /, $senNAME);
        my $firstname = $senlist[0];
        my $lastname = $senlist[$#senlist];
        my $middlepart = "";
        foreach my $i (1 .. ($#senlist-1)) {
          $middlepart .= "$senlist[$i] ";
        }
        chop $middlepart;

        $len = $#senator;
        $senator[ $len + 1 ] = [ ($senid, $first_line, $firstname,
$middlepart, $lastname, $state) ];

        $line = <SEN106>;
        $line_number++;
        $line = <SEN106>;
        $line_number++;
      }
    }
  }
}
```

FIGURE 36V

```
$line = <SEN106>;
$line_number++;

$line = <SEN106>;
$line_number++;

while( $line = <SEN106> ) {
    $line_number++;
    if ( $line =~ m/<p align=/ ) {
        goto BEGIN_Prepared_by;
    }
}
BEGIN_Prepared_by;;
my $first_line2 = $line_number;
$line =~ m/>(.)<\p>/;
my $cumulative_content = "$1 ";

$line = <SEN106>;
$line_number++;
$line =~ m/>(.)<\p>/;
$cumulative_content .= "$1 ";

$line = <SEN106>;
$line_number++;
$line =~ m/>(.)<\p>/;
$cumulative_content .= "$1 ";

$line = <SEN106>;
$line_number++;
$line =~ m/>(.)<\p>/;
$cumulative_content .= "$1 ";

$line = <SEN106>;
$line_number++;
$line =~ m/>(.)<\p>/;
$cumulative_content .= "$1 ";

my $ov = $senid . "_" . "$line_number";

$len = $#prepared_by;
$prepared_by[ $len + 1 ] = [ ($senid, $first_line2,
$cumulative_content) ];
}
$sh4 = $1;
}
elsif (.$line =~ m/<\section>/ ) {
    goto PH1;
}
}

PH1;;
if ( $filename eq "D_1_LARI_S272_106.xml" ) {
```

```
while( $line = <SEN106> ) {
    $line_number++;
    if ( $line =~ m/<\/section>/ ) {
        goto END_process_header;
    }
}
END_process_header;;

}

# <p><string italic="off" hidden="on">SECTION VII. SUBJECT
INDEX</string>ACADEMIC PERFORMANCE&tab; S.7, S.514, S.564</p>
# <p>ACCESS TO HEALTH CARE&tab; S.6, S.1678, S.1690</p>

sub process_index_old {
    $line =~ m/<p>.+<\/string>(.)&tab; (.*)<\/p>/;
    my $subject = $1;
    my $bill_seq = $2;

#<p align="right">Administrative procedure--Department of Health and Human
Services&tab; S.331, S.1327</p>
#<p>AGED&tab; S.10, S.51, S.331, S.391, S.472, S.718, S.784, S.792,</p>
#<p align="right"> S.1023, S.1074, S.1142, S.1327, S.1499, S.1678, S.1760</p>

    N3:while( $line = <SEN106> ) {
        $line_number++;
        if ( $line =~ m/<p.*>(.)&tab; (.*)<\/p>/ ) {
            my $subject = $1;
            my $bill_seq = $2;
            my $comma = $3;
            # IS THERE A CONTINUATION...
            while ( $comma eq "," ) {
                my $buf = <SEN106>;
                $line_number++;
                $buf =~ m/<p.*>(.)&tab; (.*)<\/p>/;
                my $bill_seq = $1;
                my $comma = $2;
                if ( $comma eq "" ) {
                    goto N3;
                }
            }
        }
    }

#<p></p>

    elsif ( $line =~ m/<p><\/p>/ ) {
    }
    else {
        goto THEEND;
    }
}

# <p><string italic="off" hidden="on">SECTION VII. SUBJECT
INDEX</string>ACADEMIC PERFORMANCE&tab; S.7, S.514, S.564</p>
```

FIGURE 36X

PERSISTENT ARCHIVES
Inventors: Reagan W. Moore, et al.
Howrey Docket No. 02737.0004.NPUS01
97/118

```
#<p align="left" fontname="Courier New" fontsize="20" bold="on">Committee on
Rules and Administration</p>
#</section>
#<section>
#<header>
#<p align="center" fontname="Courier New" fontsize="20"
bold="on"><field><fldinst> PAGE </fldinst><fldrslt><string charstyname=""
#
fontname="Courier New" fontsize="20"
bold="on">2</string></fldrslt></field></p>
#<p align="right" fontname="Courier New" fontsize="20" bold="on">
#
<string fontname="Courier New" fontsize="20" bold="on">Lincoln D.
Chafee</string></p>
#<p align="left" fontname="Courier New" fontsize="20" bold="on"><string
fontname="Courier New" fontsize="20" bold="on">
#
SUBJECT INDEX TO SPONSORED AND COSPONSORED MEASURES AND
AMENDMENTS</string></p>
#<p align="left" fontname="Courier New" fontsize="20" bold="off"></p>
#</header>
#<p>ACCESS TO HEALTH CARE&tab; S.494</p>
#<p>ACCIDENT PREVENTION&tab; S.149, S.936</p>
```

```
sub process_index {

    $line =~ m/<p>.+<\/string>(.)&tab; (.*)<\/p>/;
    my $subject = $1;
    my $bill_seq = $2;
    my @bill_list = split( /\./, $bill_seq );

    my $sub = $subject;
    $sub =~ s/ /\./g;
    $ti_value{ $sub } = "";

    foreach my $item (@bill_list) {
        $item =~ s/\/s*\/g ;

        my $len = $#topic_index;
        $topic_index[ $len + 1 ] = [ ($senid, $line_number, $sub,
$item) ];
    }
}
```

```
#<p align="right">Administrative procedure--Department of Health and Human
Services&tab; S.331, S.1327</p>
#<p>AGED&tab; S.10, S.51, S.331, S.391, S.472, S.718, S.784, S.792,</p>
#<p align="right"> S.1023, S.1074, S.1142, S.1327, S.1499, S.1678, S.1760</p>
```

```
N3:while( $line = <SEN106> ) {
    $line_number++;
    if ( $line =~ m/<p.*>(.)&tab; (.*)<\/p>/ ) {
        my $subject = $1;
        my $bill_seq = $2;
        my $comma = $3;
        my @bill_list = split( /\./, $bill_seq );
```

FIGURE 36Y

```
# IS THERE A CONTINUATION...
while ( $comma eq "," ) {
    my $buf = <SEN106>;
    $line_number++;
    $buf =~ m/<p.*>(.\d)(.*)<\/p>/;
    my $bill_seq = $1;
    my $comma = $2;
    my @bill_list = split( /,/, $bill_seq );
    foreach my $item (@bill_list) {
        $item =~ s/\\s*//g ;
        my $len = $#topic_index;
        $topic_index[ $len + 1 ] = [ ($senid,
$line_number, $subject, $item) ];
    }
    if ( $comma eq "" ) {
        goto N3;
    }
}

#<p></p>

elseif ( $line =~ m/<p><\/p>/ ) {
}
else {
    goto THEEND;
}
}
```

FIGURE 36Z

```
<!ELEMENT SLA_collection = (senate_file*)>
<!ELEMENT senate_file = (filename, header_page?, section*, subject_index?)>
<!ELEMENT header_page = (senator?, report_period?, prepared_by?)>
<!ELEMENT senator = (first_name?, middle_part?, last_name?, state?)>
<!ELEMENT report_date = (start_date?, end_date?)>
<!ELEMENT section = (sec_number, sec_name, bar*)>
<!ELEMENT bar = (bill | resolution | amendment)>
<!ELEMENT resolution = (joint_resolution, concurrent_resolution, simple_resolution)
<!ELEMENT bill = (bar_id, date_introduced, sponsor?, cosponsors?, official_title,
                  (latest_status | status_actions), abstract, committee?)>
<!ELEMENT amendment = (bar_id, date_introduced, submitted_for, congressional_record,
                       sponsor?, submitted_by?, cosponsors,
                       statement_of_purpose, (latest_status | status_actions),
                       abstract)>
```

FIGURE 37

```
#!/usr/local/bin/perl -w
use strict;

# caccf_xml FILE REC_SIZE

my $REC_SIZE = 164;

die "**** Record size must be 164!\n" if ( $ARGV[1] != 164 );

my $rec_count = 0;
my $rec;
my $fsize;

open(IN, "< $ARGV[0]") || die "can't read from: $!";

$fsize = -s IN;

print "**** WARNING: file size ($fsize) is no multiple of record size
($REC_SIZE)\n"
    if ( $fsize % $REC_SIZE != 0 );

open(OUT, "> $ARGV[0].xml") || die "can't write to: $!";
open(LOG, "> $ARGV[0].xml.log") || die "can't write to: $!";

print OUT "<caccf_records>\n";

while (read(IN, $rec, $REC_SIZE) == $REC_SIZE) {
    print OUT "<rec no=\"", ++ $rec_count, "\" ";
    print OUT "ms=\"", substr($rec, 0, 1), "\" ";
    print OUT "cc=\"", substr($rec, 1, 2), "\" ";
    print OUT "tc=\"", substr($rec, 3, 2), "\" ";
    print OUT "rn=\"", substr($rec, 5, 5), "\" ";
    print LOG "**** ERROR, >", (substr($rec, 10, 1)), "< instead of blank in #11,
rec $rec_count:\n[$rec]\n\n"
        if (substr($rec, 10, 1) ne " ");
    print OUT "na=\"", substr($rec, 11, 28), "\" ";
    print OUT "dp=\"", substr($rec, 39, 4), "\" ";
    print OUT "sn=\"", substr($rec, 43, 9), "\" ";
    print OUT "mg=\"", substr($rec, 52, 4), "\" ";
    print OUT "pg=\"", substr($rec, 56, 2), "\" ";
    print OUT "dd=\"", substr($rec, 58, 8), "\" ";
    print OUT "hc=\"", substr($rec, 66, 20), "\" ";
    print OUT "hs=\"", substr($rec, 86, 2), "\" ";
    print OUT "oc=\"", substr($rec, 88, 5), "\" ";
    print OUT "db=\"", substr($rec, 93, 8), "\" ";
    print OUT "rc=\"", substr($rec, 101, 1), "\" ";
    print OUT "ai=\"", substr($rec, 102, 1), "\" ";
    print OUT "ra=\"", substr($rec, 103, 1), "\" ";
    print OUT "re=\"", substr($rec, 104, 2), "\" ";
    print OUT "le=\"", substr($rec, 106, 2), "\" ";
    print OUT "ma=\"", substr($rec, 108, 1), "\" ";
    print OUT "se=\"", substr($rec, 109, 1), "\" ";
}
```

FIGURE 38

```
#!/usr/local/bin/perl -w
use strict;

# caccf2oracle FILE REC_SIZE

my $REC_SIZE = 164;

#die "*** Record size must be 164!\n" if ( $ARGV[1] != 164 );

my $rec_count = 0;
my $rec;
my $fsize;

my %month = ("01" => "JAN",
             "02" => "FEB",
             "03" => "MAR",
             "04" => "APR",
             "05" => "MAY",
             "06" => "JUN",
             "07" => "JUL",
             "08" => "AUG",
             "09" => "SEP",
             "10" => "OCT",
             "11" => "NOV",
             "12" => "DEC" );

sub mm_dd_yy {
    my ($a_date) = @_ ;
    if ($a_date =~ m|([0-9]{2})/([0-9]{2})/([0-9]{2})| ) {
        return "TO_DATE('$2-$month{$1}-19$3')";
    } else {
        print "*** ERROR   Rec #\$rec_count, mm_dd_yy, not a date >>>$a_date<<<\n";
        return "NULL";
    }
};

sub yymmdd {
    my ($a_date) = @_ ;
    if ($a_date =~ m|([0-9]{2})([0-9]{2})([0-9]{2})| ) {
        return "TO_DATE('$3-$month{$2}-19$1')";
    } else {
        print "*** WARNING Rec #\$rec_count, yymmdd, not a date >>>$a_date<<<\n";
        return "NULL";
    }
};

sub escapeQuote {
    my ($a_string) = @_ ;
    if ($a_string =~ s/\\/\\/g) {
        print "*** NOTE   Rec #\$rec_count, quote escaped >>>$a_string<<<\n";
    }
    return $a_string;
}
```

FIGURE 39A

39A

39B

```
open(OUT,"> $ARGV[0].sql") || die "can't write to: $!";
open(LOG,"> $ARGV[0].sql.log") || die "can't write to: $!";

while (read(IN, $rec, $REC_SIZE) == $REC_SIZE) {
    print OUT "insert into CACCF values (";
    print OUT "''", ++ $rec_count, "''"; # internal record number
    print OUT "''", substr($rec,0,1), "''"; # ms
    print OUT "''", substr($rec,1,2), "''"; # cc
    print OUT "''", substr($rec,3,2), "''"; # tc
    print OUT "''", substr($rec,5,5), "''"; # rn
    print OUT "''", escapeQuote(substr($rec,11,28)), "''"; # na
    print OUT "''", substr($rec,39,4), "''"; # dp
    print OUT "''", substr($rec,43,9), "''"; # sn
    print OUT "''", substr($rec,52,4), "''"; # mg
    print OUT "''", substr($rec,56,2), "''"; # pg
    print OUT "''", mm_dd_yy(substr($rec,58,8)), "''"; # dd
    print OUT "''", escapeQuote(substr($rec,66,20)), "''"; # hc
    print OUT "''", substr($rec,86,2), "''"; # hs
    print OUT "''", substr($rec,88,5), "''"; # oc
    print OUT "''", mm_dd_yy(substr($rec,93,8)), "''"; # db
    print OUT "''", substr($rec,101,1), "''"; # rc
    print OUT "''", substr($rec,102,1), "''"; # ai
    print OUT "''", substr($rec,103,1), "''"; # ra
    print OUT "''", substr($rec,104,2), "''"; # re
    print OUT "''", substr($rec,106,2), "''"; # le
    print OUT "''", substr($rec,108,1), "''"; # ma
    print OUT "''", substr($rec,109,1), "''"; # se
    print OUT "''", substr($rec,110,1), "''"; # ci
    print OUT "''", substr($rec,111,1), "''"; # pp
    print OUT "''", yymmdd(substr($rec,112,6)), "''"; # dt
    print OUT "''", substr($rec,118,1), "''"; # lr
    print OUT "''", substr($rec,119,3), "''"; # br
    print OUT "''", substr($rec,122,2), "''"; # ag
    print OUT "''", substr($rec,124,1), "''"; # sc
    print OUT "''", escapeQuote(substr($rec,125,29)), "''"; # co
    print OUT "''", escapeQuote(substr($rec,154,2)), "''"; # ty
    print OUT "''", escapeQuote(substr($rec,156,2)), "''"; # pc
    print OUT "''", substr($rec,158,2), "''"; # mc
    print OUT "''", substr($rec,160,2), "''"; # pr
    print OUT "''", substr($rec,162,2), "''"; # fl
    print OUT "''";\n";
};

print LOG "[$ARGV[0]: read ", $rec_count*$REC_SIZE, " bytes = $rec_count
records x $REC_SIZE]\n";

print LOG "*** WARNING: file size = $fsize\n"
    if ( $rec_count*$REC_SIZE != $fsize );
```

FIGURE 39B

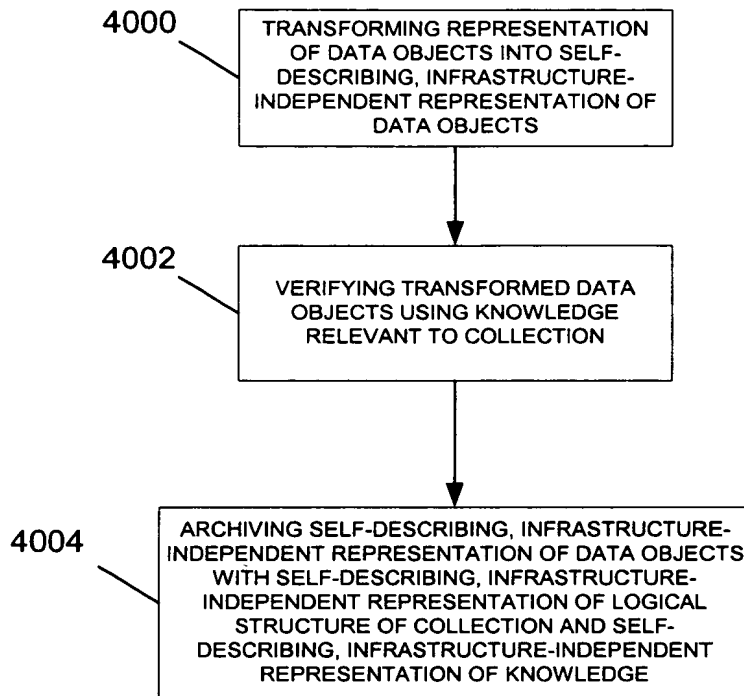


FIGURE 40

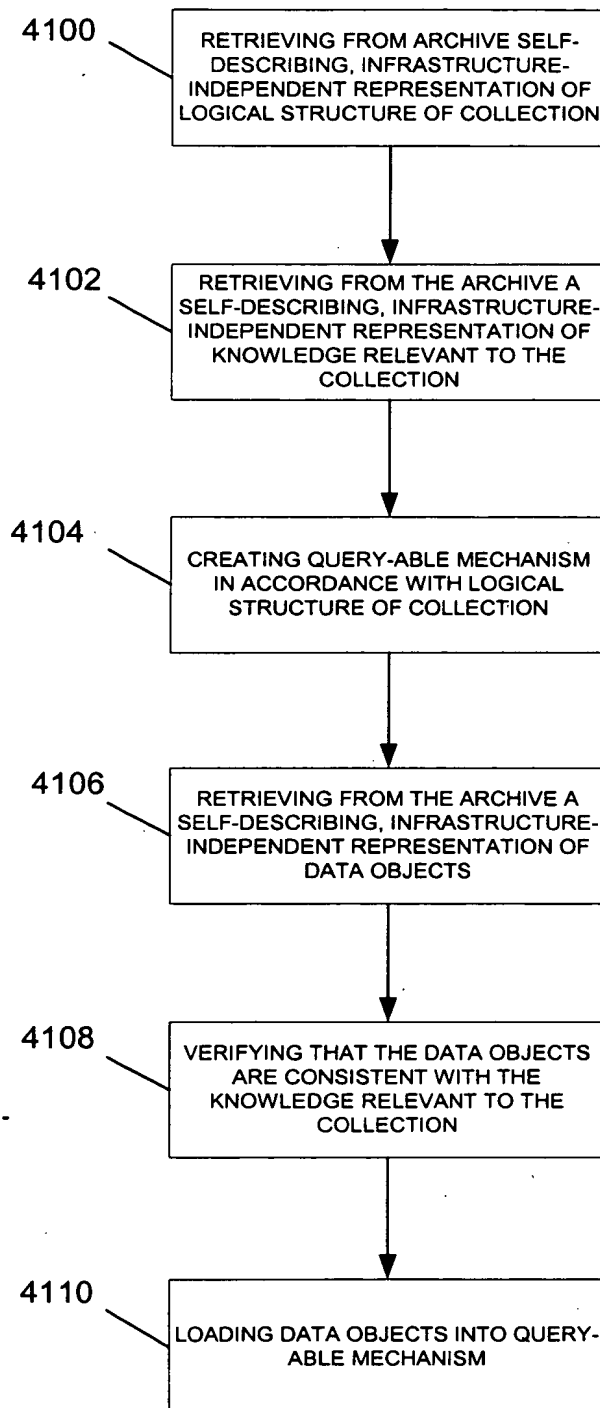


FIGURE 41A

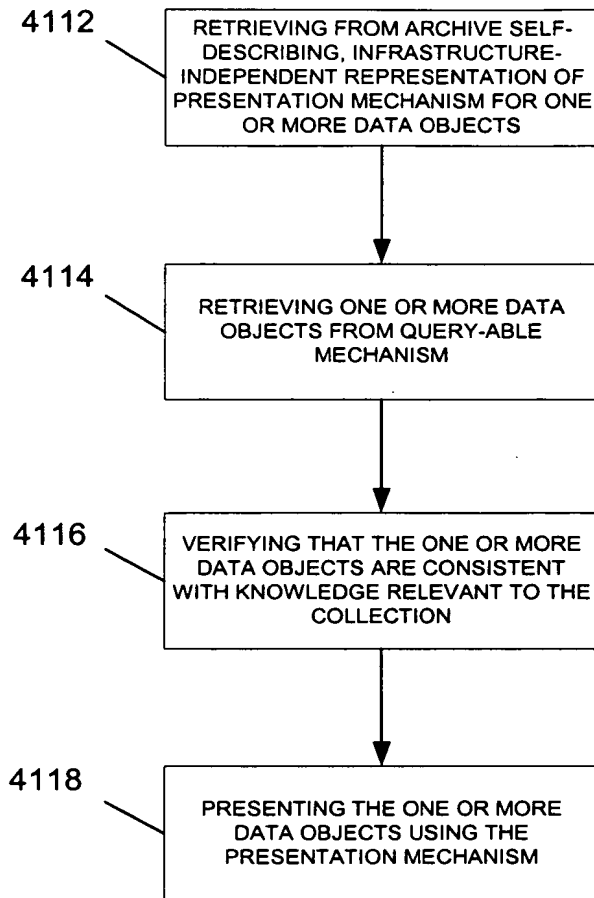


FIGURE 41B

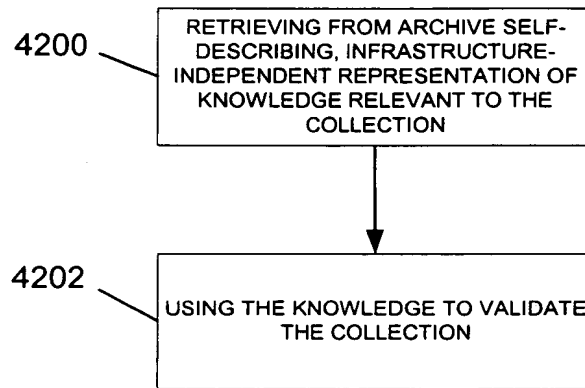


FIGURE 42

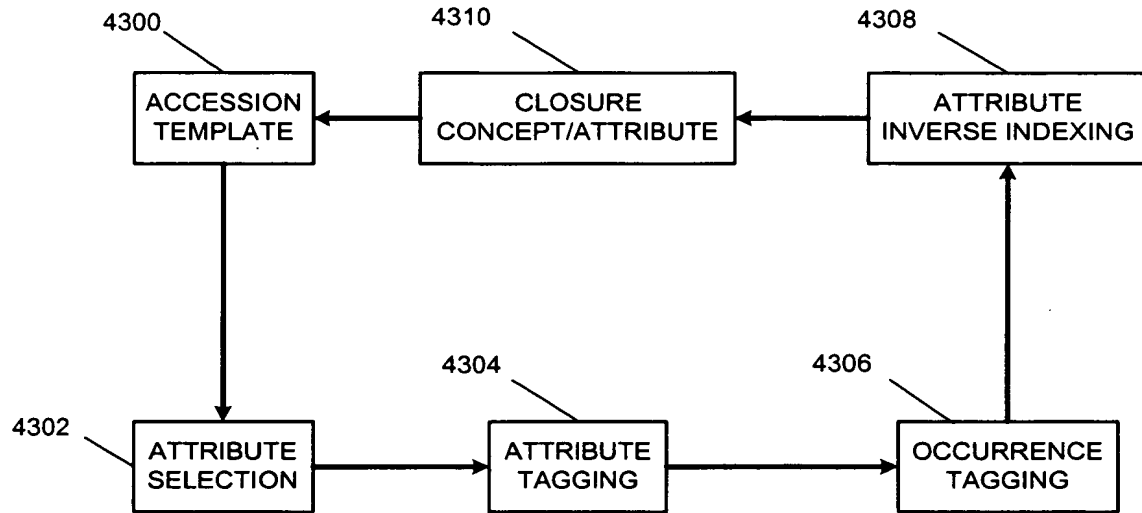


FIGURE 43

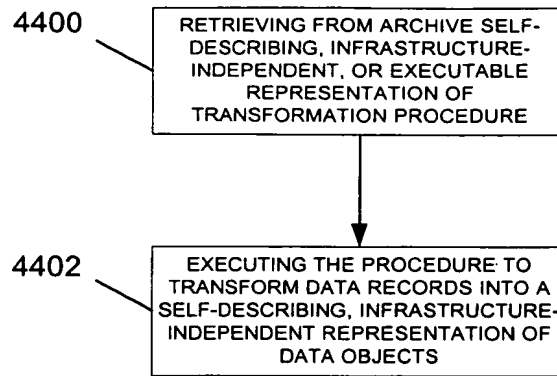


FIGURE 44A

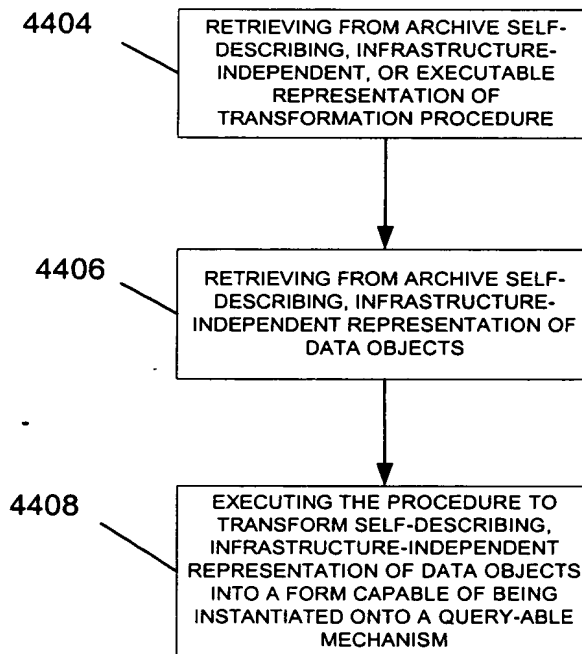


FIGURE 44B

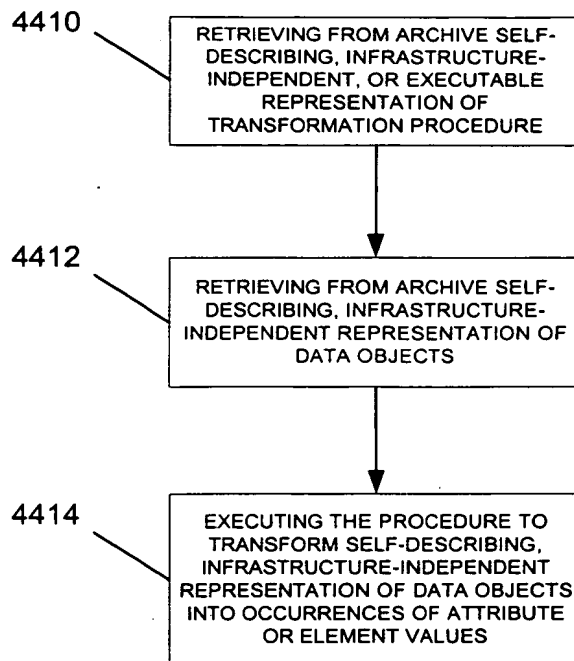


FIGURE 44C

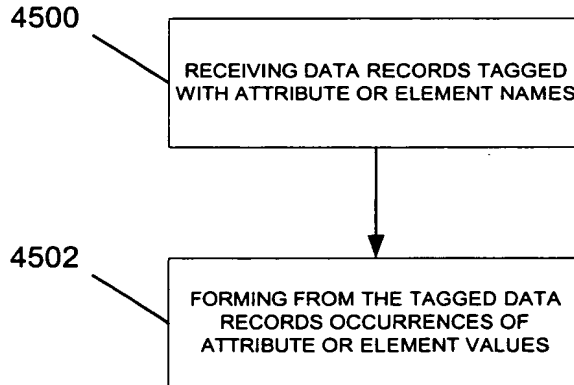


FIGURE 45

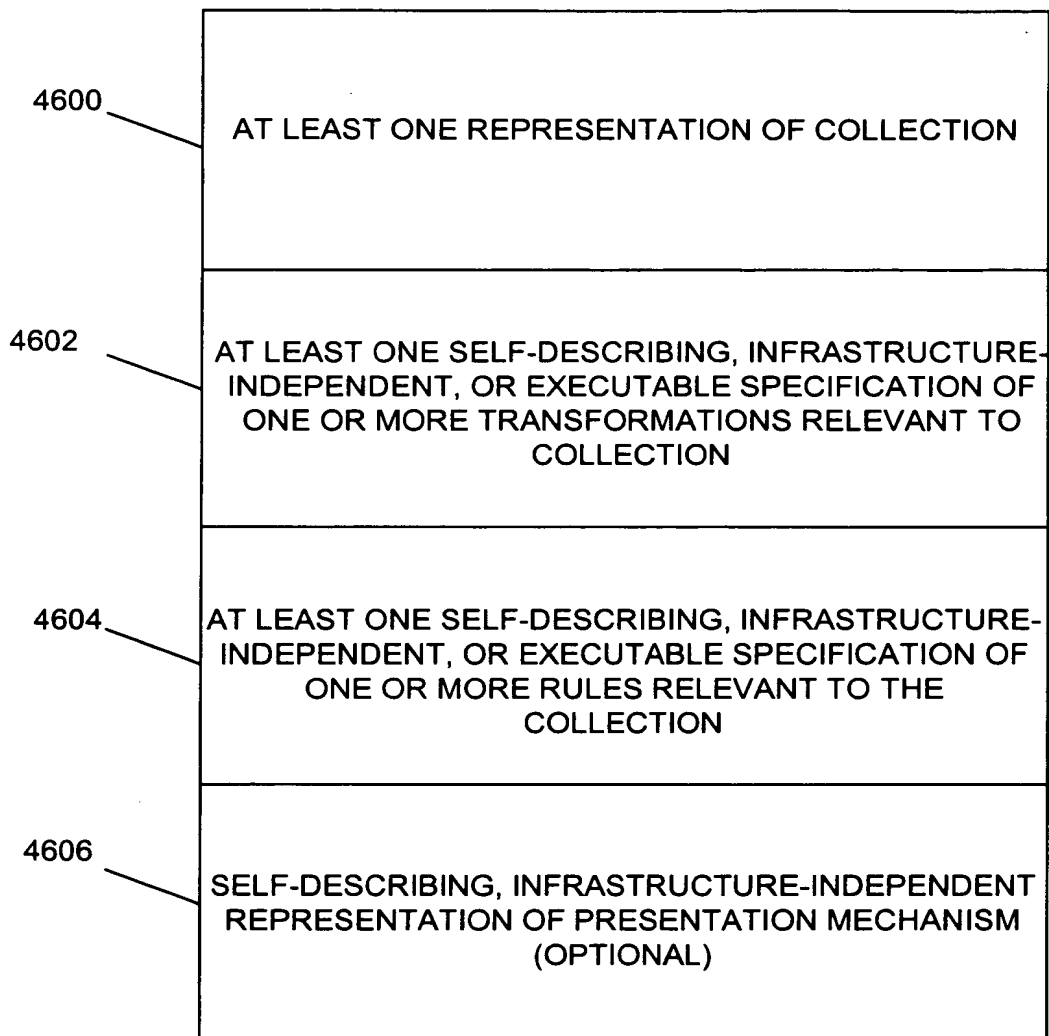


FIGURE 46

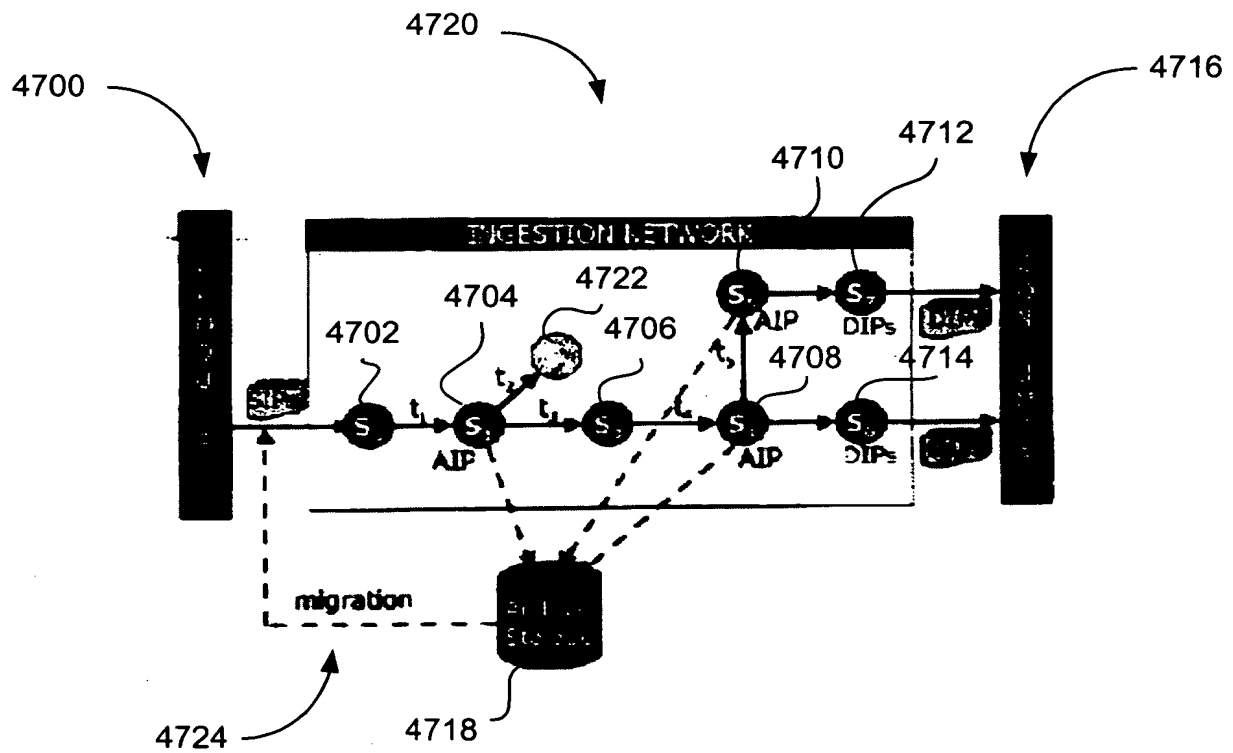


FIGURE 47

4800	{	<p>%%% Rules for (ELEMENT X (Y,Z))</p> <p>false ← P:X, not (P.1):Y.</p> <p>false ← P:X, not (P.2):Z.</p> <p>false ← P:X, not P[→→].</p> <p>false ← P:X[N→→], not N=1, not N=2.</p>	<p>% 1st child is not Y</p> <p>% 2nd child is not Z</p> <p>% there are no children</p> <p>% there are other children</p>
4802	{	<p>%%% Rules for (ELEMENT X (Y Z))</p> <p>false ← P:X[1→A], not A:Y, not A:Z</p> <p>false ← P:X, not P[→→].</p> <p>false ← P:X[N→→], not N=1.</p>	<p>% 1st child other than Y or Z</p> <p>% there are no children</p> <p>% a non-1st child</p>
4804	{	<p>%%% Rule for (ELEMENT X (Y)*)</p> <p>false ← P:X[→→C], not C:Y.</p>	<p>% a non-Y child</p>

FIGURE 48

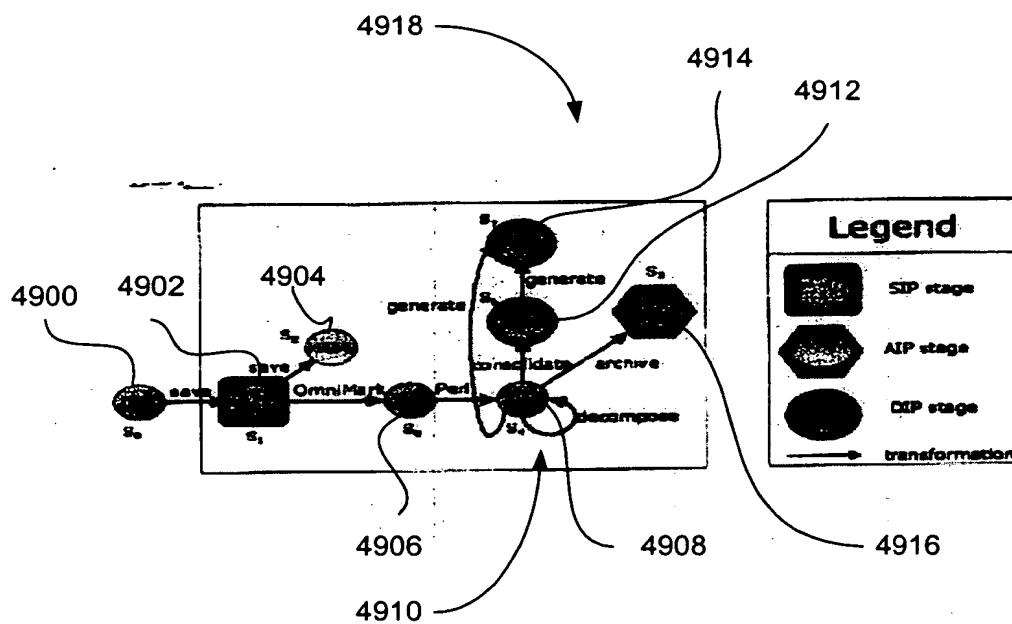


FIGURE 49

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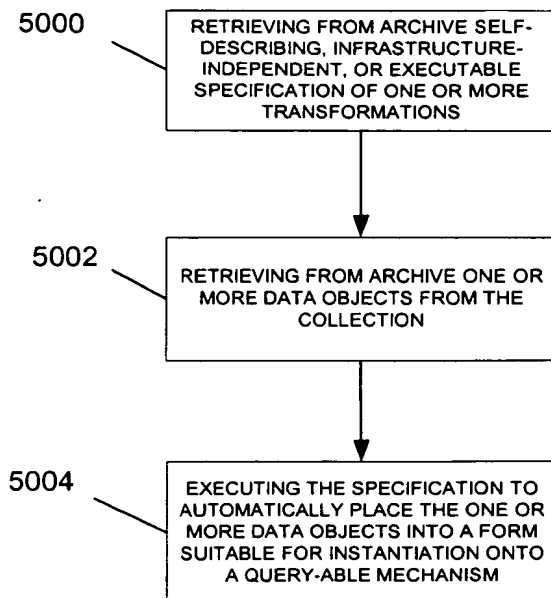


FIGURE 50

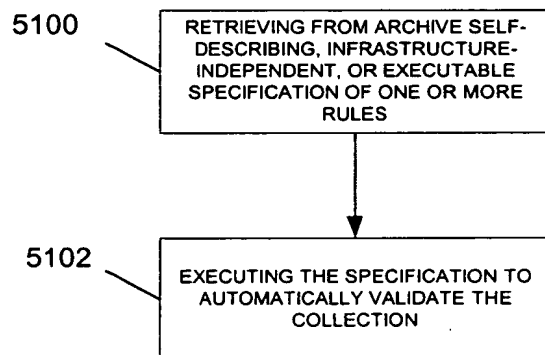


FIGURE 51A

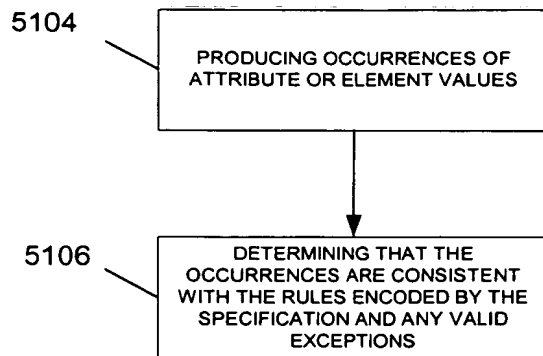


FIGURE 51B

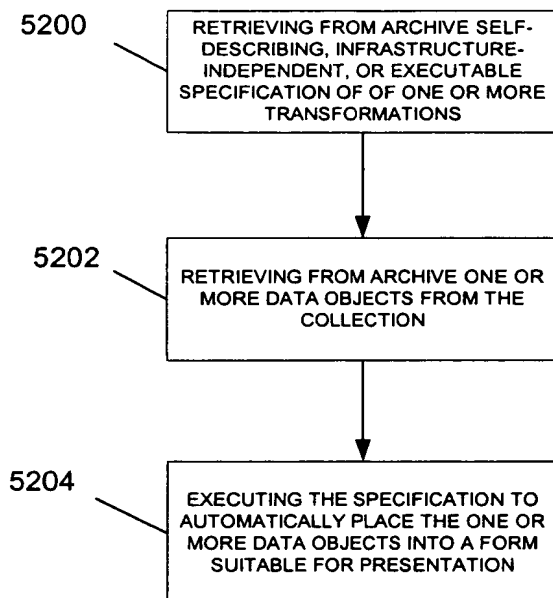


FIGURE 52

```
#-----
# An excerpt of an example of a Topic Map for the SLA (Senate)
# Collection.
#
# 4 Topics are shown: t1, t2, t3, and t4 of type "SubjectEntry"
# --> These are actually Subject Index Entries found in the
# raw data
#
# For each topic, there is an occurrence list of locator elements
# corresponding to the bills that discuss that topic.
#
# In addition, topics are related to each other through associations.
# Here we created two types of associations:
# <assoc types="CoDiscussedInExactlyOneBill">
# <assoc types="CoDiscussedInTwoOrMoreBills">
#
# showing the "degree of connectedness" between two topics.
# These would be value-added relationships, as they are implicit
# in the raw data, and discovered by our topic map building
# routines.
#
# Bertram Ludaescher & Richard Marciano -- March 20, 2001
#-----
```

```
<!DOCTYPE topicmap [
  <!ELEMENT topicmap (topic | assoc)* >
  <!ELEMENT topic (topname | occurs)* >
    <!ATTLIST topic
      id ID #REQUIRED
      types CDATA #IMPLIED
    >
  <!ELEMENT topname (basename, dispname, sortname)>
    <!ELEMENT basename (#PCDATA) >
    <!ELEMENT dispname (#PCDATA) >
    <!ELEMENT sortname (#PCDATA) >
    <!ELEMENT occurs (locator)* >
    <!ELEMENT locator EMPTY >
    <!ATTLIST locator
      role CDATA #REQUIRED
      href CDATA #REQUIRED
    >
  <!ELEMENT assoc (assocrl)* >
    <!ATTLIST assoc
      types CDATA #IMPLIED
    >
  <!ELEMENT assocrl EMPTY >
    <!ATTLIST assocrl
      role CDATA #REQUIRED
      href CDATA #REQUIRED
    >
]>
```

54A

54B

54C

FIGURE 54A

```
<topicmap>
<topic id="t1" types="SubjectEntry">
  <topname>
<basename>Apartment houses</basename>
  <dispname>Apt. Houses</dispname>
<sortname>APARTMENTHOUSES</sortname>
  </topname>
  <occurs>
<locator role="DiscussedIn" href="#S.463" />
  </occurs>
</topic>
```

```
<topic id="t2" types="SubjectEntry">
  <topname>
<basename>Children</basename>
  <dispname>Child.</dispname>
<sortname>CHILDREN</sortname>
  </topname>
  <occurs>
<locator role="DiscussedIn" href="#S.300" />
<locator role="DiscussedIn" href="#S.463" />
<locator role="DiscussedIn" href="#S.1638" />
<locator role="DiscussedIn" href="#S.1673" />
<locator role="DiscussedIn" href="#S.1709" />
<locator role="DiscussedIn" href="#S.Res.125" />
<locator role="DiscussedIn" href="#S.Res.258" />
  </occurs>
</topic>
```

```
<topic id="t3" types="SubjectEntry">
  <topname>
<basename>Welfare</basename>
  <dispname>Welf.</dispname>
<sortname>WELFARE</sortname>
  </topname>
  <occurs>
<locator role="DiscussedIn" href="#S.463" />
<locator role="DiscussedIn" href="#S.1277" />
<locator role="DiscussedIn" href="#S.1709" />
<locator role="DiscussedIn" href="#S.Con.Res.28" />
<locator role="DiscussedIn" href="#S.Res.125" />
<locator role="DiscussedIn" href="#S.Res.260" />
  </occurs>
</topic>
```

FIGURE 54B

```
<topic id="t4" types="SubjectEntry">
  <topname>
    <basename>Youth employment</basename>
    <dispname>Youth empl.</dispname>
    <sortname>YOUTEMPLOYMENT</sortname>
  </topname>
  <occurs>
    <locator role="DiscussedIn" href="#S.463" />
  </occurs>
</topic>
```

```
<assoc types="CoDiscussedInExactlyOneBill">
  <assocrl role="DiscussedInSameBill" href="t1" />
  <assocrl role="DiscussedInSameBill" href="t2" />
  <assocrl role="DiscussedInSameBill" href="t3" />
  <assocrl role="DiscussedInSameBill" href="t4" />
</assoc>
```

```
<assoc types="CoDiscussedInTwoOrMoreBills">
  <assocrl role="DiscussedInSameBill" href="t2" />
  <assocrl role="DiscussedInSameBill" href="t3" />
</assoc>
```

```
</topicmap>
```

FIGURE 54C